THE ECONOMIC DEMOGRAPHY OF SOUTH AFRICA

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VERKLARING

Ek, die ondergetekende, verklaar hiermee dat die werk in hierdie proefskrif vervat, my eie oorspronklike werk is wat nog nie vantevore in die geheel of gedeeltelik by enige ander Universiteit ter verkryging van 'n graad voorgelê is nie.

J.L. Sadie

OPSOMMING

Dit is merkwaardig dat Bevolking, wat aan die middelpunt staan van die Rykdom van Volkere indien nie van die Armoede nie, so weinig aandag in die ekonomiese literatuur van Suid-Afrika geniet. Dit is waarskynlik waarom die regering in 1997 'n NUWE bevolkingsbeleid – so gespesifiseer in die konsepwitskrif – kan voorstel wat weinig aanduiding toon van 'n waardering vir die Ekonomie van Demografiese tendense. Hierdie dissertasie is 'n poging om te demonstreer waarom die leemte gevul moet word, en om spesifieke onderwerpe, binne die breëre raamwerk, vir verdere ondersoek aan die lig te bring.

Die demografiese toneel in Suid-Afrika leen homself tot 'n treffende demonstrasie van die ekonomiese gevolge van demografiese tendense by wyse van 'n kontrastering van die ondervinding van die snelgroeiende, jeugdige Swart bevolking – met 'n totale fertiliteitsyfer (TFS) van nagenoeg 3.7, nadat dit gedurende die vyftigerjare 6,75 was – en dié van die demografies-ouer nie-Swart bevolking, onder wie die Blankes, met 'n TFS wat reeds ver benede verplasingskoers van 2,1 is, en Asiërs (Indiërs) en Kleurlinge wat alreeds byna daardie peil bereik het. Aangesien eersgenoemde etniese groep ook nog 'n oorheersende aandeel van meer as driekwart in die totale SA bevolkingsgrootte het, is dit onvermydelik dat die nadruk sal val op die ekonomiese gevolge van snelle bevolkingsgroei met die daarmee samehangende demografiese groothede: fertiliteit, mortaliteit, migrasie, leeftyd- en geslagsamestelling, geografiese verspreiding en ook "ekonomiese kwaliteit" soos dit in die aanbod van ondernemerskap gemanifesteer word.

Die analise word in die tradisionele vraag en aanbod paradigma aangebied. Aanbod word ontleed deur demografiese faktore te koppel met die vyf produksiefaktore waarvan die samewerking vir die skepping van die nasionale produk verantwoordelik is: ondernemers, arbeid, natuurlike hulpbronne, tegnologie en kapitaal. Die bevolking moet 'n voldoende aantal ondernemers verwek, en die twee menslike produksiefaktore benodig die bystand van een of meer van die niemenslike faktore, om die bevolking ekonomies te kan akkommodeer. Vermenigvuldigende mensegetalle kan vernietigend inwerk op natuurlike hulpbronne en kan in konflik verkeer met kapitaalvorming en tegnologie-akkumulasie en hul ekonomiese welsynsbevorderende werking.

Die vraag-aspekte word analiseer deur aan te sluit by die vier makro vraagkomponente in die nasionale boekhoudingstelsel: huishoudelike verbruik, regeringskonsumpsie, belegging (*vis-à-vis* besparing) en buitlandse handel. Aangeleenthede wat onder die loep geneem word, sluit, onder

andere, die volgende in: stabiliteit wat voorspruit uit 'n bevolkingselastisiteit van vraag wat nagenoeg 1 is; die vergelykende invloed van ekonomiese oorvloed teenoor die menslike getallefaktor; die rol van hoë fertiliteit in die verkryging van ekonomiese mag deur middel van die stembus en sy gevolge vir die omleiding van vraag; die kapitaal wat in "demografiese beleggings" geabsorbeer word; en die betekenis van die Suid-Afrikaanse produksiefaktor-begunstiging vir sy internasionale handel.

Uit bogenoemde ontledings kan gevolgtrekkinge gemaak word ten opsigte van ekonomiese groei, armoede, werkloosheid en die ekonomiese waarde van 'n menselewe.

In menslike bevolkings – minstens sover dit sub-Sahara-Afrika betref – staan kwantiteit in 'n adversatiewe houding teenoor kwaliteit.

RESUMÉ

It is remarkable that population, which is at the centre of the economic problem – the Wealth if not the Poverty of Nations – has received scant attention in economic research in South Africa. Which is probably why we can have a NEW – so designated in the Draft Report – population policy propounded by government (in 1997) which manifests little appreciation of the economics of population. This dissertation is an attempt to demonstrate why the void should be filled and to bring to light specific topics within the broader subject matter that could be fruitfully researched.

The demographic scene in South Africa lends itself to a telling demonstration of the economic effects of population movements by way of contrasting the experience of the high fertility, youthful Black population – with a total fertility rate of around 37 after having been 6,75 in the 1950s – and that of the demographically older non-Blacks, among whom the Whites exhibit a fertility level way below the replacement rate of 2,1, while that of the Asians (Indians) and Coloureds has almost reached that rate. Since the former has a share of more than a dominant three-quarters in the aggregate South African population, the emphasis is inevitably on the economic consequences of rapid population growth and its attendant demographic magnitudes: fertility, mortality, migration, age and sex composition, spatial distribution and, what is called "economic quality" of the population as manifested in its supply of enterprise.

The analysis is presented in the traditional supply and demand paradigm. Supply is examined by linking demographic forces to the five factors of production whose co-operation is responsible for the generation of the national product: entrepreneurship, (ordinary) labour, natural resources, technology and capital. The population has to generate an adequate supply of entrepreneurs, and the two human factors of production have to have one or more of the non-human factors at their disposal to accommodate the population economically. Proliferating human numbers can be destructive of natural resources, and in conflict with the formation of capital, the accumulation of technology and their potential economic welfare-enhancing operation.

The demand aspects are analysed by linking on to the four macro demand components in the national accounts system: Household consumption, Government consumption, Investment (vis-à-vis saving) and foreign trade. Some of the issues discussed are: the stability deriving from a population elasticity of demand close to 1,0; the comparative significance of the population versus the affluence factor; the role of high fertility in the acquisition, at the election polls, of

economic power via political power, and its consequences for the diversion of demand; the capital absorbed in "demographic investments"; and the significance of the South African factor endowment for its foreign trade.

From the above analyses conclusions could be drawn about economic growth, poverty, unemployment and the economic value of a life.

In human populations, in sub-Saharan Africa at least, quantity is the adversary of quality.

CONTENTS

INTRODUCTION

This dissertation deals with the economics of the South African population; the economic consequences, that is, of demographic magnitudes and movements. However, the description "economic demography" is preferred to convey a somewhat broader perspective in dealing with the subject matter. In those instances where economic data are not available or cannot be generated to quantify or otherwise depict the impingement of demographic forces upon economic processes, the demographic magnitudes have to speak for themselves as proxies of the effects at issue. The enquiry, moreover, involves some borrowing from related disciplines which may be considered outside the province of traditional economics.

The analysis is not cast in the mould of any preconceived model. It is, in part, an exercise in inference-permitting descriptive statistics, governed by economic and demographic logic. It begs definitive delineation unless one is prepared to grace it with kinship to systems dynamics.

Interaction between demographic factors and the economy is, of course, a two-way process, with the former functioning as both determinant and determinate. This dissertation will be concerned in the main with demographic phenomena as determinants, and not the reverse course of causation. While the discourse is conducted for the most part, at the macro level, recourse is had, on occasion, to the micro level.

Different views can be held about how the investigation should proceed, i.e. the sequence in which the material is to be organized and what the key issues should be around which the problématique is to be presented. In this dissertation the customary supply-and-demand approach has been elected. Part I treats of the interrelationships between population movements and magnitudes on the one hand and the five factors of production which co-operate to produce the Gross Domestic Product (GDP) or Gross National Product (GNP) or National Income (NI) on the other, viz. entrepreneurship, labour, natural resources, capital and technology. As the co-ordinator of the factors of production and as the initiator of economic growth and development, the entrepreneur merits priority of treatment. But since he is a member of the labour force (human resources) as a whole, the analysis will start off with a discussion of the latter.

In Part II the issue is approached from the demand side, with the components of the national accounts depicting the generation of the GNP, by way of the demand emanating from private households, general government, investment, and exports and imports, serving as the magnitudes to be discussed in their relation to demographic factors. The demand in this context is to be construed to encompass not only demand in the customary sense of needs supported by individually possessed purchasing power, but also needs which are converted into demand by

means of government intervention, or which could be considered for such conversion because of social and political conventions or pressure.

It is understood that, in the discussion of any sub-topic, any or all of the phenomena subsumed under demography – population size and growth, mortality, morbidity, fertility, age and sex composition, spatial distribution and migration – can serve as sources of economic change.

Wherever appropriate information or evidence from countries abroad is available, it will be introduced into the analysis. But by and large, the focus is upon demographic and economic conditions prevailing in South Africa. This geographic concept encompasses the total area included in the erstwhile Union of South Africa, estimates of economic and demographic magnitudes pertaining to the former TBVC countries having been included for those years in which they functioned as autonomous regions.

It needs to be emphasised that the role of demographic forces in the South African economic problématique is a very much neglected field of enquiry. This could be at least one of the reasons why the Ministry of Welfare and Population Development espoused a policy approach which appears to be tantamount to a virtual unwillingness to appreciate the importance of this role. In their *Draft White Paper for a Population Policy* (Government Gazette No 17529 Volume 576, 31 October 1996) it is stated that such policy should "instead of the achievement of demographic objectives, have as a major goal a broad range of social services to improve the quality of life of the entire population" (par. 1.3, p. 11). The problems resulting from human reproduction, not the levels of such reproduction, are addressed. Family planning is soft-pedalled as if quality of life is not pervasively affected by the lack of it.

It is hoped that the present enquiry will demonstrate that the achievement of demographic objectives is a meritorious endeavour, if not a *sine quo non* of population policy.

PART I:

SUPPLY

CHAPTER 1

THE SOUTH AFRICAN DEMOGRAPHIC SCENE

A brief review of demographic magnitudes and movements is presented below to serve as background information to the analyses to follow.

Since reference to ethnicity tends to be frowned upon, it needs to be stressed that in South African demography recourse to it is an indispensable aid in the production of reliable, or just credible, population data. This arises from the differences in the demographic histories of the four groups' (delineated as Whites, Asians, Coloureds and Blacks) differential levels and patterns of fertility, mortality, migration and age structures, and differing levels of comprehensiveness and errors in census and vital statistics. The relinquishment of the ethnic differentiation in the registration of births and deaths - well-intentioned as it was - produced meaningless vital statistics since 1991. Distinguishing between the four groups has the additional advantage of providing us with the necessary contrasts for an explicit illustration of the economic implications of population magnitudes. Below they are dealt with in diminishing order of demographic modernity, which is defined by the adoption of, or the approach towards, the small family system, which also defines their position on the demographic cycle. It needs to be mentioned that the South African data used in this and other Chapters do not necessarily agree with official statistics, but are the result of evaluations of, and adjustments to, those statistics. (Sadie 1970, 1972, 1988, 1992, 1993; Mostert and Lötter 1990; van Tonder & van Eeden 1975).

1.1 PROGRESSION ON THE DEMOGRAPHIC CYCLE

Figure 1.1 traces the progression of these four groups on the demographic cycle, which is not only a stylized one but is based on the historic natural increase of the Coloured population. With the 1991-1996 projected rates of natural increase as our frame of reference (Sadie 1993), the graph shows all four groups to have progressed beyond the stage of maximum growth and to be proceeding on the downward phase. Viewed in the aggregate, the South African population moved along the first phase of almost uncontrolled fertility and mortality, at the rate of natural increase of approximately 2% per annum, up to the end of the Second World War. The second, explosive phase, with mortality declining while fertility remained unchanged or even increased, lasted until the 1960s, the transitional phase of maximum growth (the third phase) registering a 2,86% per annum rate. The population is now (1996-2001) moving along the fourth phase of declining natural increase, averaging a growth rate of some 1,9% per annum. The prospects are that the downward trend will be continued.

However, when the aggregate is broken down into the traditional four population groups, we find that the historic timing as well as the absolute levels of natural increase exhibited marked differences. The White group, whose actual (total) growth rate has been fluctuating as a result of the waxing and waning of immigration, has experienced its transition to lower levels of natural increase in the first quarter of this century already - but showed a temporary revival after the 1929-1933 Depression - and was, during the middle 1990s, in the fifth phase of below-replacement-level fertility, with natural increase at a 0,7% per annum rate. The people of Asian origin reached their transition, with a maximum of 3,69% per annum natural increase, during 1946-1951, the subsequent downward course leading to a 1,34% per annum rate during 1991-96. The Coloured population had their transition during 1960-1970, the rate of natural increase peaking at 3,21%. By 1991-96 it was 1,44% per annum. In the case of the Black population the transition to lower growth is of recent origin, the zenith of 3,0% per annum having been attained during 1980-1985. It is now moving along the fourth phase of the demographic cycle.

1.2 FERTILITY

TABLE 1.1
TOTAL FERTILITY RATES BY ETHNIC GROUP

	Whites	Asians	Coloureds	Blacks
1924-1928	3,49			
1930-1933	3,16			
1935-1937	3,01	7,30	6,05	6,48
1941-1944	3,16	7,20	5,87	6,59
1945-1950	3,38	6,70	6,16	6,69
1950-1955	3,38	5,78	6,42	6,75
1955-1960	3,50	5,18	6,67	6,75
1960-1965	3,28	4,55	6,71	6,56
1965-1970	3,03	4,01	6,29	6,28
1970-1975	2,80	3,76	5,43	5,98
1975-1980	2,15	2,94	3,88	5,64
1980-1985	2,10	2,80	3,31	4,59
1985-1991	1,81	2,45	2,80	4,34
Projected:				
1991-1996	1,73	2,29	2,37	3,96
1996-2001	1,66	2,13	2,21	3.53
2001-2006	1,58	1,97	2,04	3,10
2006-2011	1.50	1,81	1,87	2,66

Source: CSS(b); Mostert & Lötter, 1990; Sadie, 1970, 1988, 1992, 1993.

The fertility component of natural increase over a period of fifty years is summarized in Table 1.1. It will be seen that the Total Fertility Rate (TFR) of the White population, after registering a secondary peak of 3,50 in 1955-1960, moved monotonically downward to 1,81 in 1985-1991. Since 1935-1937, when some fragmentary data and imputed magnitudes permitted us to estimate the TFR of the Asian population at a very high 7,30, the fertility of this group has been diminishing uninterruptedly, to reach a level, after half a century, of one-third of its initial value. The fertility of the Coloured population appears to have risen after the Second World War, to peak at 6,71 in 1960-1965, but since then has declined to a level approaching that of Asian women, i.e. 2,50 compared to 2,45. The TFR of the Black population, too, has shown an increase up to 1955-1960, but seems to have reacted fairly vigorously to the efforts of the Population Development Programme (PDP), to reach 4,34 by 1985-1991. Even so, this latter Figure is still 55% and 140% higher than that of the Coloured and White populations respectively.

To promote the potential significance of our analysis for policy-makers it has been considered preferable to quantify, illustrate and formulate conclusions and arguments by means of expected or future, rather than past, trends. To this end the fertility rates (by age) have been projected over the twenty-year period 1991-2011. The reasons for, and bases of, the projected values of the TFR set out in Table 1.1 have been furnished elsewhere (Sadie 1993, p.2), particular influence having been attributed to the PDP among the high fertility communities. All of them are expected to decline, the rate of deceleration correlating positively with the 1985-1991 levels, so that the Black/Coloured gap is reduced to 42%, the Black/Asian ratio to 47%, and the Black/White differential to 77%.

Since the age incidence of motherhood may involve economic consequences for both mother and child – the younger the mother the more onerous the burden – examples of the age pattern of fertility are presented in Table 1.2.

TABLE 1.2
1991-1996: AGE-SPECIFIC FERTILITY RATES

Age of Mother:	Whites	Asians	Coloureds	Blacks
15-19	0,0196	0,0336	0,0467	0,130
20-24	0,0939	0,1531	0,1172	0,209
25-29	0,1324	0,1492	0,1351	0,163
30-34	0,0747	0,0797	0,0990	0,133
35-39	0,0216	0,0336	0,0557	0,100
40-44	0,0036	0,0083	0,0169	0,042
45-49	0,0003	0,0010	0,0040	0,015
TFR	1,73	2,29	2,37	3,96

Sources: See Table 1.1

Table 1.2 shows that the teenage fertility rates of Blacks, expressed as a multiple of the other three groups, are:

2,8 compared to Coloureds,
3,9 compared to Asians, and
6,6 compared to Whites.

In terms of the intra-group age incidence of childbirth, weighted with the percentages of females in the 15-19 age group, the probability of a child being born to a teenager is 0,054 among White mothers, 0,080 among Asians, 0,109 among Coloureds and 0,224 among Blacks; which latter therefore constitutes a multiple of 4,1 of the probability relating to the group of lowest fertility (Whites), and of 2,8 vis-a-vis Asians.

The data above also indicate that the duration of the reproductive process is positively correlated with the level of fertility. Among Whites the process is almost completed at the age of 35, the probability of bearing another child after that being down to 7,3%. At the opposite end of the fertility spectrum the chances of a Black woman continuing to reproduce after age 35 are 19,8%. She starts earlier and continues her reproduction into a later age, but a more rapid succession of births than obtains among White women reduces the mean duration differential to below what the comparative TFR values might suggest.

1.3. MORTALITY

Mortality among the four S.A. population groups, as manifested in its obverse, viz. the expectation of life at birth, is quantified in Table 1.3:

TABLE 1.3

EXPECTATION OF LIFE AT BIRTH (YEARS)

	Whites	Asians	Coloureds	Blacks
1936-1941	61,7	51,8	43,4	40,0
1941-1946	64,1	50,6	43,4	38,3
1946-1951	65,9	55,0	46,4	41,2
1951-1956	66,7	59,1	50,7	45,7
1956-1960	67,1	60,1	53,7	51,1
1960-1965	68,1	61,5	54,1	53,8
1965-1970	68,5	61,8	53,7	54,5
1970-1975	69,0	62,5	54,5	56,7
1975-1980	69,7	64,3	57,6	57,8
1980-1985	70,5	66,4	59,5	60,0
1985-1991	72,9	67,8	61,6	61,3
Projected:				
2006-2011	74,4	69,6	65,3	67,0

Sources: See Table 1.1

The White male and female expected life expectancies in Table 1.3 record that the White group has always enjoyed a superior health status - the lowest mortality rates - followed by the Asians, the Coloureds and the Blacks, in descending order. Over time, however, the dimensions of the differentials have diminished, Whites having had 11,2 years, Asians 16 years, Coloureds 18,2 and Blacks 21,3 years added to their life expectancies during the fifty years since 1936-1941, to reduce the White/Black ratio from 154:100 to 119:100. The ratio is expected to diminish further to around 110:100 by 2006-2011, the inverse correlation between improvement in, and the level of, life expectancy continuing to hold. Between 1960-1965 and 1980-1985 the expectation of life of Blacks exceeded that of Coloureds, after having been lower for many decades.

It is interesting to note that, as a deviation from norm, Asian males enjoyed superiority over females in life expectancy before 1946. This is to be associated with maternal mortality arising from high fertility, to judge by the female survival ratios over the 15-49 age interval, which remained lower than those for males for another ten years after 1946. Since then the superiority of females in all four groups has been rising, to reach 7,1 years in the case of White women (from 3,9 in 1936-1941), 6,7 years for Asian women, 8,1 for Coloured women, and 7,0 years for Black women (from 0,9 years in 1936-1941).

Life starts with a preponderence of males, the masculinity ratio at birth ranging from around 102:100 for the Coloured and Black group to 102,5:100 for Asians and 104,5 in the case of Whites. However, as a result of higher life expectancies for females than males, the excess is whittled down with rising age, until at one or other stage, depending on the comparative levels of survival probabilities, the differential is reversed to produce female majorities which increase progressively. By 1996 the female preponderance in the age group 65 and older featured as follows:

	Female/Male ratio	**Female majority**
Whites	1,42	90 900
Asians	1,39	6 900
Coloureds	1,60	28 600
Blacks	1,53	235 300

Source: Sadie, 1993, pp. 37 et.seq.

Past migration has had some influence on the ratios. When this has been provided for we find a negative association between the ratios and levels of life expectancy at birth. One of the side effects of the above differential is that there are many more widows than widowers.

The most sensitive index of mortality and, as a rule, the one subject to the greatest diminution over time, as socio-economic conditions improve and fertility declines, is the Infant Mortality

Rate (IMR). Estimates of this magnitude are assembled in Table 1.4, and show a weighted aggregate rate of 67 per 1000 births (of all groups) for 1980-1985, and 55 for 1985-1991, the latter embodying a variation from 11 (Whites) to 60 (Blacks).

TABLE 1.4

INFANT MORTALITY RATES (per 1000 Births)

	Whites	Asians	Coloureds	Blacks
1936-1941	53	74	158	169
1941-1946	45	71	149	174
1946-1951	36	57	128	162
1951-1956	33	52	125	143
1955-1960	30	51	120	116
1960-1965	28	48	120	110
1965-1970	24	42	120	101
1970-1975	20	36	100	90
1975-1980	17	27	76	83
1980-1985	13	19	56	73
1985-1991	11	15	43	60
Projected:				
2006-2011	5	6	13	38

Source: CSS (b) & (c); Sadie, 1988, 1993.

It will be seen that the variation in IMRs is a great deal larger than shown by the total life expectation (or its inverse, the death-rate of the stable population, respectively 13,7, 14,7, 16,2 and 16,3 in the Table 1.4 population group sequence). This arises from the smaller mortality differentials among adults, and the effects of fertility levels upon infant mortality. The narrowing of the per capita income gaps between the groups should have made for some reduction of the relative IMR differentials as well. In absolute terms, the decrements in the IMR have been larger the higher the initial levels. The increasing share of infant deaths in child mortality - for example, from 74% in 1936-1941 to 88% in 1985-1991 in the case of Asian children - bears testimony to the improvement of the environment into which children were being born.

1.4 MIGRATION

Migration of significant proportions during the past fifty years has been occurring only in the case of the White and Black population groups. The former's net immigration has assumed the following average annual dimensions since its hey-day.

1963-1976	30 280
1977-1984	16 720
1985-1987	1 350
1988-1993	5 340
1994-1997	-4 090

Source: CSS (a) and (b)

The data testify to a very irregular movement of additions, by way of migration, to the White group. What they reflect is that dramatic political events in South Africa incite emigration which at times exceeds immigration in volume. When memories of these events have faded, while the economy manifests sufficient confidence-inspiring buoyancy, emigration declines and immigration surges, to produce a net inflow of new and returning inhabitants. What with the radical change in government in 1994, the high incidence of violence and corruption and the displacement of highly skilled White workers in the application of affirmative action, and the decimation of formal sector employment, the political, social and economic climate has not been conducive to the attraction of White immigrants since 1994. The actual loss through a net outflow of migrants during 1994 to 1997 could be a good deal greater than the registered 4 090 per annum, since some South African residents who leave the country purportedly only for visits abroad, do not return. For example, the excess in question over the five years 1991 to 1995, amounted to 8 290 per annum on average, when only those travelling by air are considered, and 24 460 when all modes of travel are taken into account (CSS(a) & (b)).

As the second millenium A.D. is drawing to a close, it does not appear as if net immigration is going to add to the growth of the White population group in the foreseeable future. A similar conclusion would hold for the Coloured and Asian communities.

Until the beginning of the nineteen-nineties the quantum of formal Black immigration (mostly temporary labourers) could be gauged approximately by the number of foreign-born persons registered during census enumerations, which showed diminishing numbers as from 1951 to 1985 and an increase at the time of the 1991 census, as follows:

	Male	**Female**	**Total**
1951	482 600	120 600	603 200
1985	273 300	44 800	318 100
1991	314 200	108 000	422 200

Source: CSS (c)

It is difficult to put a Figure to the degree(s) of underenumeration, which has undoubtedly varied from one census to the next. When the increase between 1985 and 1991, particularly that among women, is considered in conjunction with the decline in the number of foreign (oscillating) migrants recruited for, and working in, South African mines, it does signify a substantial influx of persons from war-torn and poverty-stricken neighbouring countries, most of it probably illegal.

After 1991 (or 1990) the situation appears to have changed quite remarkably. Estimates or guestimates of the number of illegal immigrants living in South Africa – those who entered the country without the required documents or temporary labour contracts, or who stayed behind after the expiry of their visitor visas – range from two to eight million. On the basis of some fragmentary data on the cross-border movement of persons from neighbouring states (CSS, p.0351) it has been estimated that South Africa's Black population numbers had, by 1996, been swollen by some 1 800 000 foreigners, of whom at least 1 300 000 would have been staying in the country illegally (Sadie, 1997).

Looking ahead, it seems unlikely that formal migration, as reflected in the numbers of foreign Blacks, would make significant contributions to the size of this population group. However, to the inhabitants of neighbouring countries not enamoured of national boundaries, South Africa would, by comparison, no doubt continue to look like a haven in a sea of poverty, regardless of the risk of detention and repatriation. To project their numbers is a statistically hazardous exercise.

1.5 POPULATION SIZE

In Table 1.5 we present estimates of population members at various census dates, and as projected to 2011, on the assumption of natural increase only:

TABLE 1.5
TOTAL POPULATION OF SOUTH AFRICA

	Whites	Asians	Coloureds	Blacks	Total
1936	2 016 700	227 600	851 600	6 950 100	10 046 000
1946	2 376 600	314 900	1 052 100	8 618 000	12 361 600
1951	2 649 600	377 400	1 191 800	9 645 500	13 864 300
1960	3 125 900	502 000	1 567 300	12 287 200	17 482 400
1970	3 861 700	653 800	2 130 200	16 022 000	22 667 700
1980	4 526 000	818 400	2 686 700	21 061 600	29 092 700
1985	4 853 400	898 600	2 957 800	24 449 800	33 159 600
1991	5 068 300	986 600	3 285 600	28 396 700	37 737 200
Projected					
2011	5 394 200	1 213 800	4 112 700	42 371 200	53 091 900

Sources: CSS (a); Sadie, 1988, 1993.

In Table 1.6 the main features of the population growth shown in Table 1.5 are focussed upon, by presenting the rates of growth

(1) at the start of the 55-year period,

(2) when each group reached its maximum growth,

(3) at the end of our period, and lastly,

(4) as projected during 1991-2011.

TABLE 1.6

% GROWTH RATES PER ANNUM

	Whites	Asians	Coloureds	Blacks	Total
1936-1946	1,7	3,3	2,1	2,0	2,1
1946-1951	-	3,7	-	-	2,3
1960-1965	2,1	-	3,2	-	2,7
1980-1985	-	-	-	3,0	2,7
1985-1991	0,7	1,6	1,9	2,6	2,2
Projected:					
1991-2011	0,3	1,0	1,1	2,0	1,7

Throughout the 55-year period, the growth rate of the White group, despite contributions by immigration (which was responsible for the peak of 2,1% during 1960-1965), remained at a lower level than those of the other three groups. The growth rate of the Asian population has been diminishing ever since its maximum in 1946-1951, ending up in 1,6% per annum in 1985-1991. The growth of the Coloured population reached its peak during 1960-1965, and its decline since then brought it down to 1,9% p.a. The growth rate of the Black population has been increasing all the time to its maximum of 3,0% during 1980-1985, exceeding those of all the others since 1965-1970. It is expected to continue doing so during the projection period, to register a 2% p.a. natural increase, compared to 0,3 for Whites, 1,0% for Asians and 1,1% in the case of the Coloured community. In the absence of immigration, it is projected to have a 91% share in the increment of the aggregate population, i.e. 13 975 000 out of 15 355 000, to dominate the demographic scene and bolster the aggregate rate of natural increase to 1,7% p.a., when the rest of the population will be expanding at 0,7% p.a. only. If they had multiplied at the same rate as non-Blacks since 1970, there would have been 5 880 000, or 20,7% fewer of them in 1991, of whom 4 340 000 (38%) would have been children whose coming into being would have been averted.

1.6 AGE STRUCTURES

It will be seen that of the four groups Whites are the demographically oldest and Blacks the youngest population, the respective dependency ratios (children under 15 and persons 65 years and older per 100 persons in the conventionally labelled economically active ages 15 to 64) in 1991 amounting to 46 and 80. Asians and Coloureds occupy intermediate positions. All groups are due to experience some degree of ageing but it is only the Whites who will have reached the tertiary stage by the year 2011 in which the 65+ age group is expanding faster than the under 15 category is shrinking, thus raising the dependency ratio. The other three populations will still be experiencing the economically beneficial secondary stage, with the 15 to 64 category continuing to expand in absolute and relative terms, to reduce the dependency ratios significantly, as the child components are shrinking faster than the category of elderly people is increasing.

TABLE 1.7
AGE STRUCTURES OF THE FOUR POPULATION GROUPS

		Age				
		0-14	15-64	65+	Total	Dependency Ratio
Whites	**1991**	22,1	68,5	9,4	100,0	46
	2011	17,3	69,3	13,4	100,0	44
Asians	**1991**	30,5	66,1	3,4	100,0	51
	2011	23,5	69,8	6,7	100,0	43
Coloureds	**1991**	33,4	63,2	3,4	100,0	58
	2011	25,3	70,2	4,5	100,0	42
Blacks	**1991**	40,9	55,6	3,5	100,0	80
	2011	32,6	63,1	4,3	100,0	58

Sources: Sadie, 1992, 1993.

The Black/non-Black demographic differential is at its most pronounced at the 0-14 age group. In 1991 the numerical ratio was 454:100 when the aggregate ratio was 300:100, and it is expected to rise to 613:100 by 2011 when the aggregate would stand at 390:100. The 1991-2011 change involves an absolute decline of 262 000 non-Black children and an increase of 2 387 000 Black children. When the change relates to children of schoolgoing age (6 to 19 to make allowance for some age retardation) it encompasses a 9 per cent decline (-221 000) and a 43 per cent (+3 072 000) increase respectively.

1.7 URBAN/RURAL DISTRIBUTION

Judging by the 1991 census results, adjusted for under-enumeration, the Coloured population (83%), the Whites (91%) and the Asians (96%) can be considered more or less fully urbanized, and it can be assumed that, probably, natural increase and immigration will add to the urban numbers only. According to the former Central Statistical Service's definition of "urban", the portion for the Black population would have been slightly above 35%. Judging by the push factor inherent in the inability of the rural areas to sustain living standards or, worse still, just life, one would expect the large majority of the 1991-2011 13 975 000 natural increase in the Black population to be born, and/or settle, in the urban areas, regardless of whether the latter can in actual fact provide a living to the new inhabitants.

1.8 CONCLUSION

In sum, breaking down the South African population into the customary four ethnic groups, and disregarding some overlapping of characteristics, we can observe South Africa as a demographic microcosm, with a First World, a Third World and an in-between component. Economically, socially and politically the salient feature of the microcosm is the most rapid growth of the numerically predominant Third World component, which is also the poorest; and at the opposite pole, the ever-shrinking share of the First World, most highly economically developed, constituent.

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CHAPTER 2

THE MALE LABOUR FORCE

2.1 DEFINITION OF LABOUR FORCE

The labour force (LF), in population censuses referred to as the economically active (EA) population, includes all persons who are participating, or are available for participation, in the production of goods and services which, in monetary terms, add up to the Gross Domestic Product (GDP) or National Income (NI). It encompasses employees, employers and workers-on-own-account, who are working at prevailing rates of pay or profit, or are temporarily absent from work, or are unemployed in the sense of, while not in employment or self-employment, being available for it (according to the "expanded" definition of unemployment) and actively seeking it (in the strict definition). Census data collected in conformity with the above definition do not, of course, present a comprehensive picture of labour supply in the sense of labour time offered as affected by the length of the working week, the duration of paid or unpaid holidays, the prevalence of part-time work and multiple jobholding, and do not inform us of the intensity of work effort or productivity. However, these forces do not operate directly in the demographic sphere of influence. It needs, further, to be pointed out that the definition cannot allow for the blurring of the dividing-line between membership and non-membership of the LF in traditional societies with sizeable subsistence sectors, in which respondents may report their economic status according to their perceptions instead of the factual situation.

For the purposes of our analyses, recourse will be had to the projections and other data contained in this author's monographs published by the Bureau of Market Research (BMR) of UNISA: *The South African Labour Force 1960-2005* (BMR Research Report No. 178, 1991), *A Projection of the South African Population 1991-2011* (BMR Research Report no. 196, 1993), and *Projections of the South African Labour Force 1991-2011* (BMR Research Report No. 200, 1994). The extrapolations are exclusive of migration, so as to focus attention on the effects of mortality and fertility.

2.2 POTENTIAL MANPOWER

It is common cause that the two proximate determinants of the size and composition of the LF are

(1) the size , age and sex structure and growth-rate of the population, and

(2) the propensity to participate in the LF, as reflected in the LF participation rates (LFPRs).

The first is a purely demographic force, whose role can be best illustrated by confining our analysis to males, who can be labelled primary workers, that is, of whom it is invariably expected to enter the LF at one or other stage of their lives - in contrast to women, whose reproductive function may constitute an obstacle - and by making use of the potential manpower concept.

The latter consists of all males in the EA category, which is 15-64, according to tradition. That there are youths who become EA before age 15, or persons remaining economically active after age 65, does not invalidate the outcome of our exercise.

The dynamics of manpower is then presented as the result of

1. entries, or accessions, to manpower per annum, defined as the number of survivors among males younger than 15 who survive their 15th birthday, and

2. departures, or exits, from manpower, consisting of

   (a) deaths among males within the 15-64 age group, and
   (b) those who "retire" by virtue of having passed the upper age limit of the reference group.

Rates of entries and departures are calculated by relating the numbers involved to the size of the potential manpower group. The difference between the two rates represents the rate of natural increase, while entries per 100 of departures are referred to as the co-efficient of replacement. The rates in Table2.1 are averages over periods of five years, the average of the initial and final values of the potential manpower acting as denominator. The manpower component is the percentage of the male population in the 15-64 age category.

TABLE 2.1
MANPOWER DYNAMICS

	Manpower Component %	Rate of Natural Increase	Rate of Entry	Rate of Departure due to		Co-efficient of Replacement
				Retirement	Death	
			Whites			
1991-96	69,7	0,6	2,1	-0,9	-0,6	142
2006-2011	70,5	-0,1	1,9	-1,3	-0,7	98
			Asians			
1991-96	66,5	1,7	2,9	-0,5	-0,7	234
2006-2011	69,7	0,8	2,5	-0,8	-0,9	145
			Coloureds			
1991-96	63,8	1,9	3,2	-0,4	-0,9	239
2006-2011	69,4	1,2	2,8	-1,1	-0,5	176
			Blacks			
1991-96	56,4	3,1	4,3	-0,5	-0,7	364
2006-2011	62,1	2,3	3,5	-0,5	-0,7	303

The contents of Table 2.1 fit into the demographic situation depicted in Chapter 1. The close inverse relationship between fertility, mortality and the relative size of the manpower component is revealed, as well as the positive correlation between the first two magnitudes on the one hand and the rates of entry and natural increase on the other. The high TFR of 3,96 combined with a life table mortality rate of 16,3 (compared to 13,7 for Whites) introduces into the relatively small Black manpower component (56,4%) large additions of children surviving to the age of 15 to induce an entry rate of 4,3% p.a., which produces an annual rate of natural increase of 3,1% and net departures of 0,5% p.a. through retirement and of 0,7% p.a. as a result of mortality. It is seen that these rates of departure do not change between 1991-1996 and 2006-2011, which contrasts with the situation obtaining among the three non-Black groups, whose rates of retirement will change considerably. The natural increase of Blacks is most likely to decelerate over time - from 3,1% to 2,3% by 2006-2011 - because of a decline in the rate of entry, in concomitance with a diminishing TFR. Even so, the deceleration will be less than expected to be experienced by the other three groups, with that of Whites changing into a negative 0,1%. The latter, at the most advanced stage of the ageing spectrum, have a large (69,7%) manpower component, relatively small numbers of entries, and increasing retirements as well as departures due to mortality as the age structure of the manpower moves upwards. The Asians and Coloureds occupy in between positions, both of them with manpower components larger, and rates of entry smaller, than those of Blacks. The departures from manpower correlate directly with the levels of mortality, while the exits due to retirement are highest among the White, the demographically oldest, population.

Bearing most eloquent witness to the dynamics of manpower is the co-efficient of replacement. The 1991-1996 index of 142 for Whites means that for every 100 males departing from the manpower group through death and retirement, leaving behind them 100 vacancies to be filled,

42 new job opportunities have to be created to provide full employment for this section of the population. After the turn of the Century, the new jobs to be provided on this definition will be -2 for every 100 departures. At 234 and 239, the co-efficients of replacement for Indian and Coloured males respectively are still quite high, the result of the timing of the reduction in fertility and mortality. Table 2.1 shows that, as these two population groups move further away in time from their transition from high to low fertility, the indices are due to diminish very significantly.

Not so in the case of the Blacks: Their co-efficient reveals that, during 1991-1996, for every 100 departures from manpower whose places can be filled by 100 entries, 264 new employment opportunities have to be generated to provide for the burgeoning residual additions. This latter magnitude is expected to decline, but to remain above 200 during 2006-2011, which is four-and-a-half and two-and-two-thirds times that of the Indian and Coloured communities respectively, while it is infinitely larger than the White males' -2. The differential job-creating demands upon the economy emerge starkly.

The demographic mobility inherent in the high co-efficient of replacement, or rapid renewal of manpower, of the youthful population has potential or theoretical economic merit in that the continual inflow of large contingents of young entrants would increase the adaptability of manpower to the needs of economic change and development. Instead of having to retrain and re-educate older workers, set in their ways, the qualifications of the new entrants can be adapted to fit the changing occupational requirements of the economy. However, for this potential merit to be converted into practice, these new entrants should have employment opportunities in which they can exercise their talents and skills. In the Third World communities - and the Black population can, for the most part, be type-cast as such - this prerequisite for effective realisation does not obtain. The theoretical merit is non-operative. Only the prejudicial attribute remains.

2.3 MALE LF PARTICIPATION

To convert the potential manpower data into LF magnitudes, we add age groups 65-69 and 70-74 to the EA age schedule - since some people continue working after age 65 - and apply the relevant LFPRs to the relative population. The LFPRs can be compressed into a summary index, the gross average years of EA life, by expressing them as fractions of 1 – to represent probabilities of being in the LF at various ages – and aggregating these fractions. If five-year intervals are used, multiplication by five is required. Using w_x (or worker rate) to symbolise an LFPR at age x (or x+5 for quinquennial age groups), this summary index becomes Σw_x. To demonstrate the influence of mortality on the duration of EA life, we calculate the net years of EA life by applying the L_x values from the life table (the age composition of the stationary male population) to w_x and dividing by l_x from the same life table, which in this case will be l_{15},

Figure 2.1

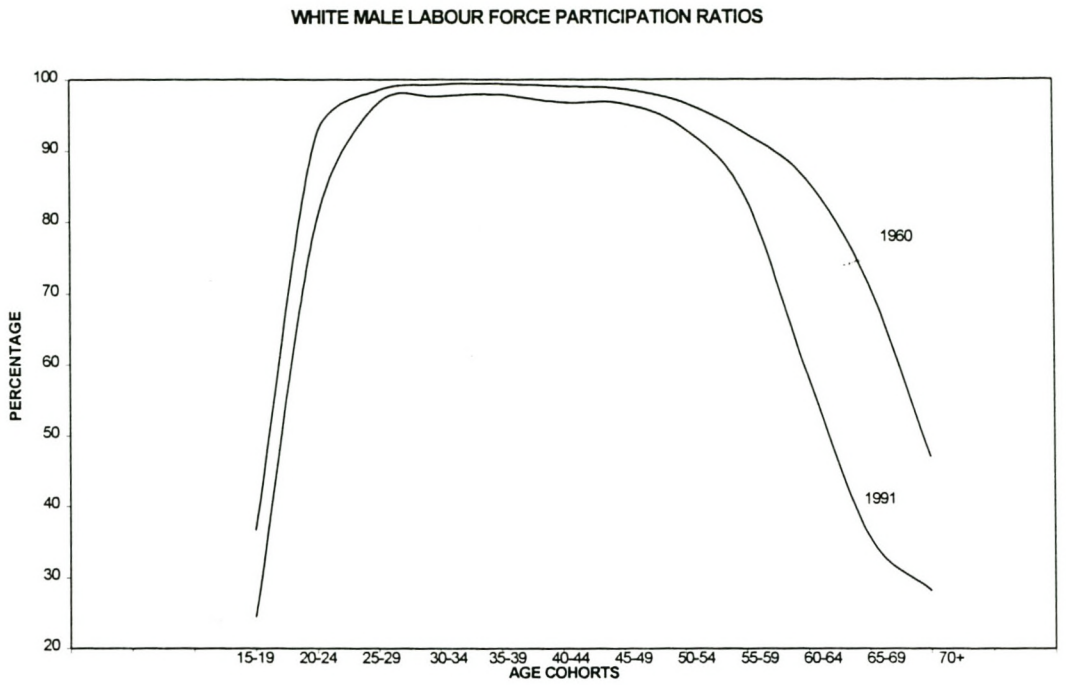


Figure 2.2

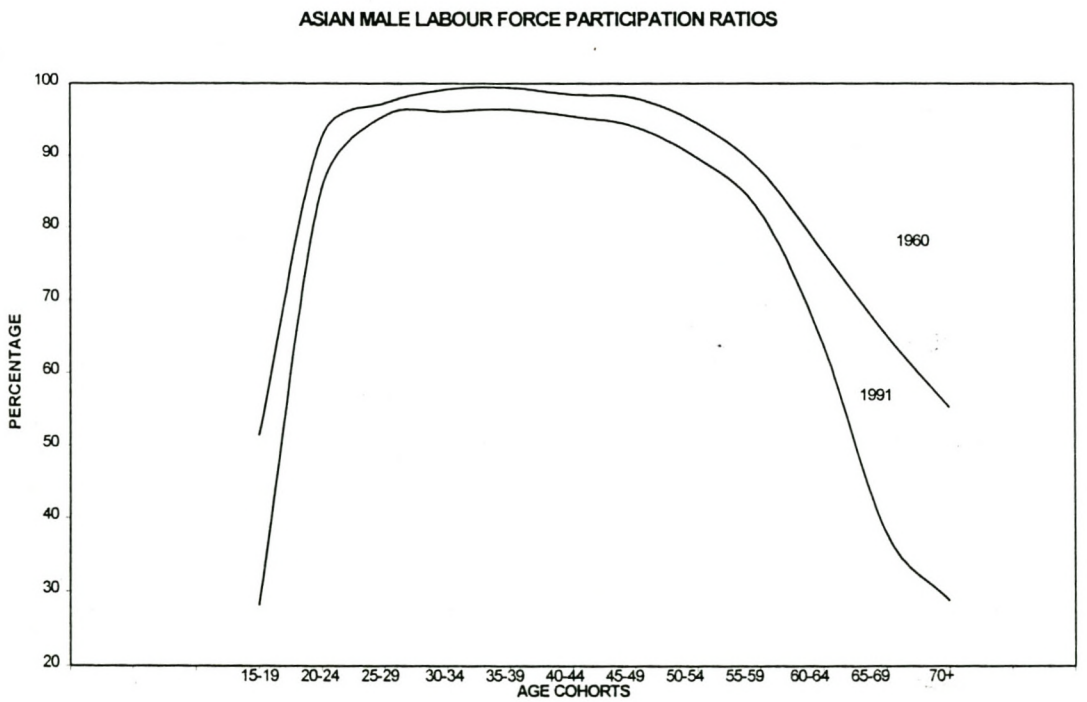


Figure 2.3

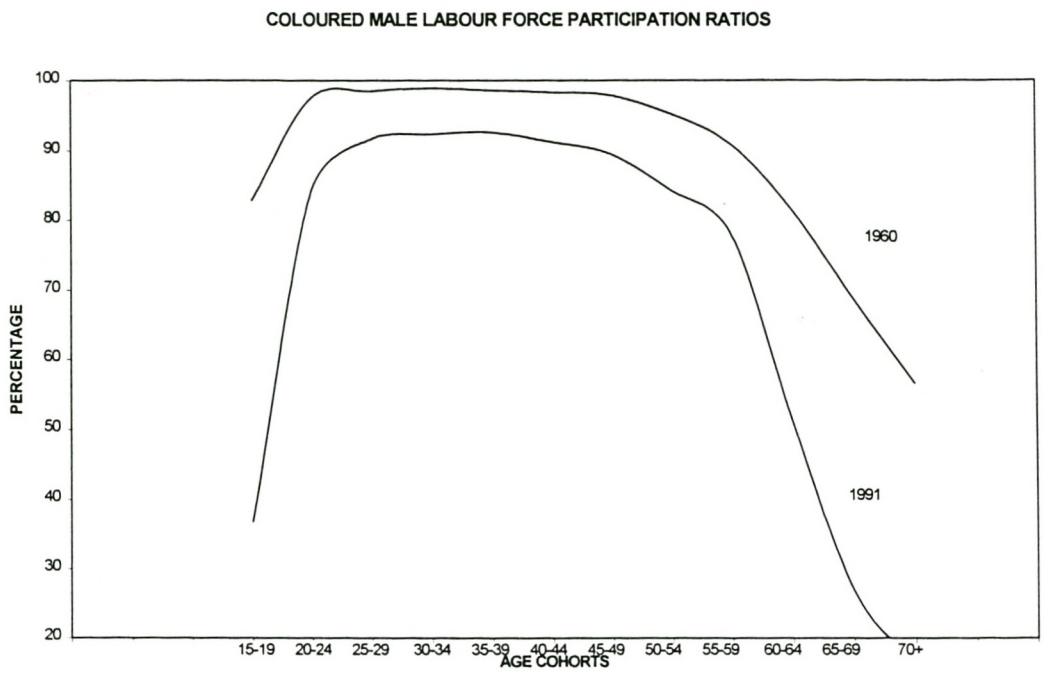
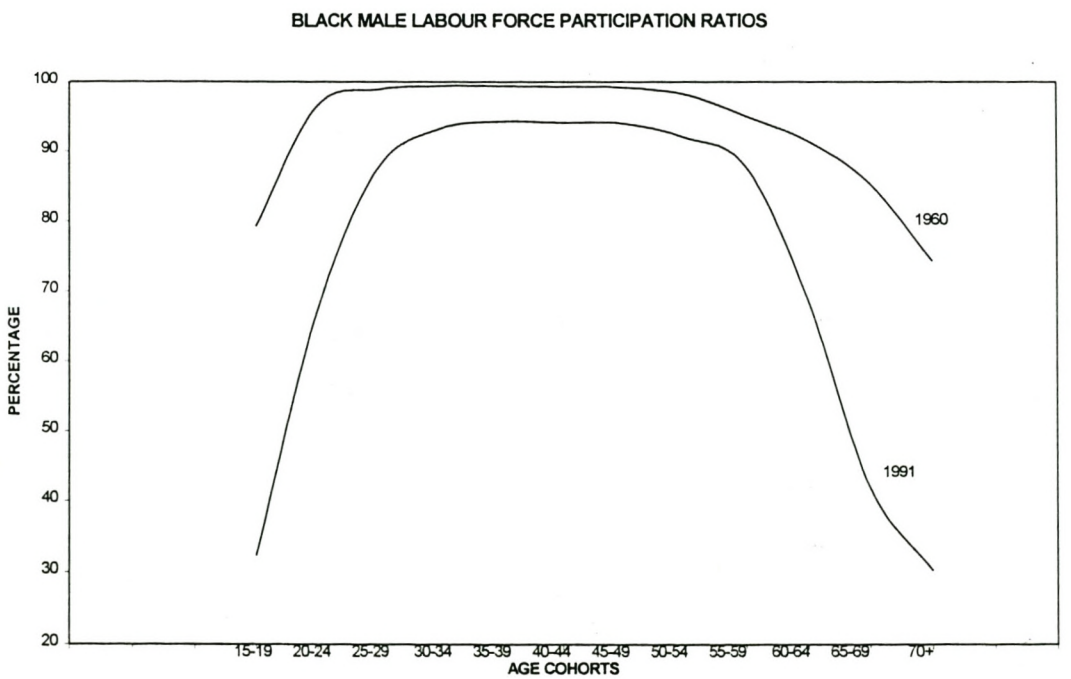


Figure 2.4



since LFP is presumed to start at age 15. The index can be connoted by $\Sigma Lw_x/l_x$ or Tw_x/l_x. When we compute the duration of life spent in retirement, we have recourse to working-life tables in which the divisor becomes lw_x instead of l_x, to denote the net expected years of life spent outside the LF by only those who are, or have been, members of the LF. An example of such a working-life table for Black males in 1991 is presented in Appendix A. The difference between whole life and working life expectation equals expected length of life in retirement.

The LFPRs for 1960 and 1991 detailed in Appendix B, are graphically portrayed in Figures 2.1, 2.2, 2.3 and 2.4, and reflect a dome-like, or inverted, parabolic pattern of well-nigh universal applicability. Differences among male populations relate to the absolute levels of the curves. Typically, males start entering the labour market at one or other stage after age 15. By the age of 35 the process of accession comes to an end, with LFPRs attaining maxima close to 100%, which levels are more or less maintained until the beginning of the withdrawal phase around the age of 55. The changes that occur within the same communities over time and the different LFPRs between communities at different levels of economic developments are, for the most part, located at the accession and the withdrawal phases of EA life. In the former case the LFPRs at the beginning and end of EA life are declining. In the latter instance the less developed and lower-income communities manifest higher LFP than the higher-income populations, but over time the differences diminish. The Figures in Appendix B show that the range in indices of gross years of EA in 1960 life between the highest income group (the Whites) and the lowest (Blacks) was 50,9 and 55,8 respectively. By 1991 it had become 44,5 and 44,1 respectively. The latter surprising result must be attributed to the abnormally low LFPRs of Blacks between ages 20 and 30, which are presumably the result of the violence, unrest and unemployment which were the hallmark of life in the townships. The struggle for political power and the inability to find jobs must have acted as disincentives even among Blacks in the ages of maximum participation whose LFPRs were lower than those of Asians and Whites in 1991, as in the case of the 20-29 category. This means that the relatively small manpower component, as indicated in Section 2.2, was no longer being compensated for by greater intensity of LFP.

In Table 2.2 changes in the gross expected years of EA life of an average male over time are compared with the net years of EA life:

TABLE 2.2

DIFFERENCES BETWEEN GROSS AND NET YEARS OF EA LIFE

		1960	1970	1980	1985	1991	2011
WHITES:	**Gross**	50,9	50,1	46,7	45,4	44,5	42,0
	Net	43,3			40,2	39,9	38,6
	Diff.	7,6			5,2	4.6	3.4
ASIANS:	**Gross**	50.8	47,7	46,1	45,2	44,7	42,4
	Net	42,4			38,6	38,4	37,4
	Diff.	8,4			6,6	6,3	5,0
COLOUREDS:	**Gross**	53,3	49,7	45,7	44,1	41,7	41,1
	Net	42,6			35,6	34,1	33,8
	Diff	10,7			8,5	7,6	7,3
BLACKS:	**Gross**	55,8	53,0	49,2	47,0	44,1	43,1
	Net	42,1			37,8	36,4	37,0
	Diff.	13,7			9,2	7,7	6,1

The difference between the two magnitudes has been diminishing for all four groups, indicating a declining influence of mortality on the length of EA life. However, LFP, as reflected in the gross years index, has been decreasing more rapidly than mortality has, effectively reducing the number of years spent inside the LF and raising the number of years spent outside the LF. This result is confirmed by the working-life table computations, the outcome of which, in the form of the difference between total life and working life expectancy, is outlined in Table 2.3 for the census years 1960 and 1991.

TABLE 2.3

DIFFERENCE IN YEARS BETWEEN TOTAL LIFE AND WORKING LIFE EXPECTANCY

	1960	1991	2011	1960	1991	1960	1991	1960	1991	2011
Age	Whites			Asians		Coloureds		Blacks		
15	5,3	10,2	12,2	3,7	6,9	3,5	6,4	2,6	5,5	8,4
20	5,4	10,2	12,2	3,8	7,0	3,6	6,4	2,6	5,5	8,5
25	5,4	10,3	12,4	3,8	7,1	3,7	6,6	2,7	5,5	8,6
30	5,4	10,4	12,8	4,0	7,2	3,9	6,7	2,7	5,6	8,8
35	5,6	10,6	13,0	4,0	7,3	4,0	6,9	2,9	5,7	9,0
40	5,6	10,6	13,0	4,0	7,3	4,1	7,0	3,0	5,8	9,1
45	5,8	10,5	13,4	4,0	7,2	4,3	7,1	3,1	5,9	9,5
50	5,8	10,5	13,6	4,0	7,1	4,4	7,1	3,3	6,0	9,4
55	5,7	9,9	13,7	4,0	7,0	4,6	6,9	3,4	6,1	9,9
60	5,7	8,1	12,1	3,8	6,2	4,6	5,0	3,6	5,2	9,4
65	5,9	6,6	10,8	3,7	5,1	5,0	4,5	4,0	4,2	6,0
70	6,1	6,3	10,4	4,3	4,6	5,5	4,5	4,8	3,4	6,5

Over time the two opposing forces - increasing total life expectancy and decreasing working life expectancy - have been raising the average years of life spent in retirement by the average male LF member and, as exemplified by the extrapolated 2011 values for Blacks and Whites, are due to continue doing so, to add 4,2 and 4 years respectively to the numbers obtaining in 1991 for age 60. The latter year had already revealed an advance of 1,6 and 2,4 years respectively on those of 1960. For Asians the advance was 2,4 and for Coloureds 1,3 years. Obviously, to maintain living standards during life in retirement, more had to be earned, and will have to be earned, per year of shrinking EA life, to provide for increasing years of non-EA life. To facilitate appreciation of the economic implication of this tendency, we can revert to the concept of the net expected years of EA life - which means avoiding recourse to the statistical convention of the working-life table of applying the maximum LFPR to ages below the age of maximum LFP - and compare them with the whole life expectation at age 15 or whatever higher initial age we elect to cover the whole age spectrum of EA. In this way we include the effect of the increase over time in the average age of accession to the LF. Continuing the convention of 15 as initial age of entry into the LF, we arrive at the comparative magnitudes presented in Table 2.4:

TABLE 2.4

YEARS OF EXPECTED LIFE AND EA LIFE

	1960	1991	2011
WHITES:			
Net years of EA life	43,3	39,9	38,6
Total life expectancy at age 15	52,4	55,7	56,8
Difference	9,1	15,8	18,2
ASIANS:			
Net years of EA life	42,4	38,4	37,4
Total life expectancy at age 15	49,1	51,1	52,2
Difference	6,7	12,7	14,8
COLOUREDS:			
Net years of EA life	42,6	34,1	33,8
Total life expectancy at age 15	47,5	47,7	47,9
Difference	4,9	13,6	14,1
BLACKS:			
Net years of EA life	42,1	36,4	37,0
Total life expectancy at age 15	46,1	49,3	52,8
Difference	4,0	12,9	15,8

The Figures in Table 2.4 show that all four groups have been experiencing considerable increases between 1960 and 1991 in the expected number of years spent outside the LF after age 15. They range from 6 years among Asians to 8,9 among Blacks. The 2011 values indicate a continuation of the trend, but at a reduced tempo. The 1960-1991 trend is perhaps most explicitly depicted by the changes in the ratios between life expectancies outside and inside the LF. They increased from 21% to 40% for Whites, from 16% to 33% for Asian males, from 12% to 40% for Coloureds, and from 10% to 35% for Blacks. To provide for the increasingly non-active life during the decreasing years of EA life requires either larger savings out of wages or increases in the latter, or both. If under 1960 LF conditions a 10% saving of a worker's wage deposited in a pension fund earning a (real) rate of interest - money rate less allowance for inflation - of 5% per annum were sufficient to provide for the period of life outside the LF, the 1991 conditions would

demand a 16,8% saving in the case of White males, and a 36,6% saving in the case of Blacks, or two-and-two-thirds times more than before. The alternative remedy would be a 68% and a 266% increase respectively in their earnings. Deeming 1960 and 1991 as dating two successive LF generations, this alternative would require an annual increase in productivity of 1,7% and 4,4% respectively. In the light of the economic history of South Africa, the former percentage is on the outer limits of likelihood; the latter lies far outside the realm of feasibility.

If we assume that no male engages in economic activity before age 15, we can determine the portions of life spent by the average male as net consumer, by comparing the net years of EA life with the expectation of life at birth. The 1960, 1991 and projected portions are as follows:

	1960	**1991**	**2011**
Whites	33,0%	42,4%	45,6%
Asians	29,5%	40,5%	43,2%
Coloureds	17,6%	40,8%	47,2%
Blacks	17,0%	37,1%	41,8%

The obverse of these magnitudes tells us that the EA portion of life has slipped from 67% according to 1960 data to 57,6% in 1991 among Whites, and in the case of Blacks from 83% to 62,9%. *Ceteris paribus*, the burden per individual to provide for the net consumption phase of life increases.

In discussions on pension schemes it has often been erroneously argued that Black persons do not live long enough after retirement to derive full benefit (compared to the other population groups) from pension funds, and should instead opt for provident funds. The comparative years spent in retirement which appear in Table 2.3 cannot serve as evidence, since they are affected by the level of the LFPRs. A worker who retires at age 55, 60 or 65 can expect the benefit of a monthly pension for the rest of his life, not for the rest of life of those whose period of retirement is being reduced by remaining in the LF after the above ages. So it is the total life expectancies which have to be compared, as follows for 1991:

	AGE:		
	55	**60**	**65**
Whites:	20,5	16,9	13,8
Asians:	17,3	14,2	11,5
Coloureds:	15,7	13,0	10,7
Blacks:	17,9	14,9	12,2

It is seen that Blacks are better off than Asians and Coloureds, and not significantly worse off than Whites. The erroneous impression derives from the disparity in life expectancies at birth,

which in the Black/White juxtaposition is 57,8 versus 69,3 years for the 1985-1991 period, and which is for the most part a function of a disparity in infant and child mortality. Once the first few critical years of life have been successfully passed, the probabilities of survival, as between the four population groups, move closer to one another.

2.4 CAUSAL FACTORS IN LFP

Since intragroup changes over time and intergroup differences are, for the most part, located at the lower and upper ends of the age profile of LFP, the forces operating among males at these ages have to be identified. Obviously, age of entry into the LF is positively associated with the periods spent in primary, secondary and tertiary educational institutions. That these periods may be very long in some instances is evidenced by the fact that maximum participation is not reached before age 35-39. They have been lengthened by the introduction and/or enforcement of compulsory education combined with the enactment of minimum ages of formal employment. As the technological content, the complexity and sophistication of the economic processes increase, ever higher levels of education and training are demanded. For an equilibrating response to be called forth the returns for investment in human capital by way of education and training have to be adequate, since rising wages by themselves increase the cost of education by way of raising the cost of non-participation in the LF. By means of its subsidisation or defrayment of the costs of education the state reduces the expense to the individual, thus raising the levels of human capital formation and lowering the LFPRs. The opportunity cost of schooling in the form of earnings foregone is, of course, zero when the qualifications required for a specific occupation have not yet been attained, or when jobs are not to be had. Up to 1985 the inverse relationship between ability to afford the direct and opportunity cost - as represented by income per head - and the LFPRs for ages below 25 is reflected in the differential levels of the latter. The 1991 Figures display some oddities which may be a manifestation of socio-economic life in a turmoil.

Another determinant of the age of entry is the industrial composition of the economy. With child labour proscribed in urban industries the importance of agriculture in the economic life of the communities is manifested in the LFPRs of youthful males. Subsistence agriculture, where the substitutability of labour for capital and technology is high, lends itself to the employment of young children as unpaid family workers of whom it is expected to make a contribution to the family's economic activity at an early stage. It is possible that not all of them are reported as economically active in census forms. In so far as they are, the urbanisation process, which reduces their opportunities while providing better educational facilities, has been reducing the LFPRs.

At the upper end of the age scale workers have to contend with a *force majeure* at one or other

stage, usually on the 65th birthday, in the form of an obligatory retirement age as prescribed by employment and pension scheme provisions. But the progressively earlier retirement - at least until 1994 - from the LF over time on the part of those who have not yet reached the age of enforced retirement is, for the most part, a voluntary decision permitted by the necessary financial capacity to do so. The meagre research on this topic undertaken in South Africa would indicate that the large majority prefer not to remain economically active beyond the retirement age (President's Council, 1988, p 105; Rip, 1979, p 37) while significant numbers would even opt for early retirement if allowed to do so (Snyman, 1991), a reaction which was demonstrated in practice during 1991-1993. This may be the result of a weak work ethic, the incapability of the occupation to provide intellectual satisfaction to the worker, or a lack of interest in the work performed. For some persons early retirement is an involuntary condition arising from an inability to procure a job because of prejudice against older workers and an adverse stereotyping of them. Worldwide the incidence of long term unemployment (12 months and longer) experienced by them is highest, in a ratio, compared to young workers, which vary from 1,7:1 to 7,5:1 (Tabah, 1988, p 130). It is also contended that a continuation of employment after retirement would impede the upward mobility of younger workers, making for frustration and less than optimum performance. This is not a valid argument since there is no reason why persons who have reached the retirement age should not be moved out of the line function to serve in a consultative capacity.

Of course, not all the characteristics attributed to the older workers which militate against their employment, to induce lower LFP, are imagined rather than real. The latter will be discussed after a review of the ageing process to be observed in the South African LF. At this stage it can be mentioned that in so far as they militate against the employability of older workers in modern industry a preponderance of mining and secondary industry with advancing technology, in the process of modernisation of the economy, is likely to depress LFP at the higher ages. The tendency is reinforced by the decline in the relative importance of agriculture where self-employment permits of self-determined and gradual retirement. The growing importance of the informal sector, where self-employment is also a pertinent feature, has a contrary effect, as has a rising share of service industries in an advancing economy in which certain positive attributes of older workers can come into operation.

Termination of LF membership or non-participation for reasons other than death presupposes some financial ability to support life in the form of past savings, or government or family assistance. Increasing provision of pension schemes, the financial strength of which is being boosted by increasing receipts out of rising wages and salaries, and the augmentation of social pensions, enhance the ability to retire, thus inducing a lowering of LFPRs. However, if pension benefits are related to the last year's, or even the last day's salary or wage, they will not conduce to retirement before the obligatory age, particularly when the economy is subject to chronic inflation.

With regard to men in the prime of their working lives, here defined as those aged 30 to 49 - though some researchers prefer 25 to 54 - there was very little difference between the four population groups in 1960, with LFPRs close to 100 per cent. Since then the levels have declined in all cases, but least among Whites, which is in contrast to what would be expected if the ability to remain outside the LF is measured by average amounts of financial resources available as represented by the *per capita* personal income, as follows for 1991:

	Per capita personal income	**LFPR Age 30-49**
		%
Whites	23 030	97,3
Asians	8 560	95,6
Coloureds	5 180	91,5
Blacks	2 410	93,5

Sources: Martins, et.al., 1994

However, point of time comparative per capita incomes cannot serve as unique criteria of welfare or measure the reaction to improvements in economic fortunes - of which the Whites enjoyed the least (their average income having actually declined since the mid-seventies), and the Asians the most, followed by the Coloured and Blacks, in that order - or reflect differences in the taste for work (or work ethic). Disregarding the Coloured group, whose LFP is somewhat out of line in the associatory context, the differential incomes can provide an explanation when they are interpreted as the costs of non-participation. Clearly the cost will be lower for Blacks than for Asians, whose cost in turn will be lower than that of Whites. By 1991 this has been reinforced by the decline in expected income of Blacks arising from the very low probability of finding a paid job within a stagnant economy. At the same time the cost of participation for them had increased greatly by 1991 by reason of unrest, violence, arson, taxi wars and intimidation. LFP is reduced on both counts. This would explain also the abnormally low LFPRs for 20-24 and 25-29 in 1991. The financial resources for the assumption of this level of LFP are provided by way of the mutual aid inhering in the extended family system, and the increasing amounts of social welfare payments, such as old-age pensions, shared within this kind of household. About the pension paid to rural Blacks it has been declared that "firstly, and most importantly, it is ... viewed as a household asset. It does not get spent by the elderly persons themselves in the same way as a pension going to a White elderly person" (Lund, 1993, p 18).

The LFP of Coloured males in the prime of life has been consistently below that of the other three groups ever since 1960, even after allowing for the slight differential in the incidence of disability. In this they assimilate to the male LF of temperate South America (United Nations, 1988, p 39). The somewhat higher long-term rate of unemployment among them than among Asians and Whites may be one of the reasons. There is some evidence that in the lesser skilled circles the taste for work is lacking in intensity. One researcher found a negative attitude towards

work among 16,2 per cent of his survey group who tended to turn down offers of employment because of unrealistically high wage expectations (Wolmarans, 1976). To adopt this attitude they need to be supported by wives, other relatives and the social security system. The latter in the form of disability pensions, family maintenance payments, child allowances and foster parent grants, expressed as a per capita average of the total population, amounted to R134 in 1990, compared to R110 for Asians, R45 for Whites and R18 for Blacks. The addition of old-age pensions raises these Figures to R223, R181, R142 and R81 respectively (Lund, 1992, p 90), all of which add to the sustenance of three generation families. We are informed by social workers that there are indeed many families living on the proceeds of social welfare payments.

Lastly, among all four groups one encounters the phenomenon of differential LFP according to marital status. Married men are more likely to be members of the LF than non-married ones (never married, widowed, divorced) as evidenced by the following 1991 comparative LFPRs for men of prime age: Whites 98,3 per cent vs. 87,5 per cent; Asians 97,5 per cent vs. 78,3 per cent; Coloureds 96,1 per cent vs. 80,4 per cent and Blacks 98,0 per cent vs. 79,2 per cent. The differentials also hold for the quinquennial age groups within the prime age category. But, as Bowen and Finegan have pointed out in their exhaustive analysis of LFP in the United States, the direction of causality is not clear. Married men may be compelled by their family obligations - which unmarried males may not have - to enter the labour market in greater relative numbers; or unmarried males eschew, or drop out of, the LF for the same reasons that they avoid marriage or have their marriages dissolved (1969, p 45).

2.5 LF NUMBERS

After adjustments to census data, the application of past and projected LFPRs to the male populations (past and projected) produced the LF numbers summarised in Table 2.5. The breakdown of the annual average increments into three age categories permits us to perceive the effects of differential and declining fertility and mortality. They are (i) the age of accession, (ii) the prime age category, 30-49 and (iii) the mature group, 50+.

TABLE 2.5
THE MALE LABOUR FORCE

TABLE 2.5(a)
WHITES (1985-1991 TFR = 1,81):

		ANNUAL INCREMENTS BY AGE			
	TOTAL LF	15-29:	30-49:	50+:	All Ages:
1960:	881 000				
		10 300	7 500	5 200	23 000
1970:	1 112 000				
		3 730	14 000	1 970	19 700
1985:	1 409 000				
		450	8 470	4 050	12 970
1991:	1 486 770				
		1010	6320	7580	14 910
1996:	1 561 310				
		-4710	6200	7270	8760
2001:	1 605 110				
		-5360	5900	3490	4030
2006:	1 625 250				
		-1940	-2320	2560	-1700
2011:	1 616 750				

TABLE 2.5(b)
ASIANS (TFR = 2,45):

		ANNUAL INCREMENTS BY AGE			
	TOTAL LF	15-29:	30-49:	50+:	All Ages:
1960:	119 300				
		1 800	1 970	590	4 360
1970:	161 400				
		1 080	3 060	760	4 900
1985:	235 100				
		1 100	2 440	1 500	5 040
1991:	265 260				
		1160	2490	1600	5250
1996:	291 490				
		420	2200	1830	4450
2001:	313 750				
		-210	2440	1550	3780
2006:	332 660				
		90	1400	1100	2590
2011:	345 600				

TABLE 2.5(c)

COLOUREDS (TFR = 2,80):

		ANNUAL INCREMENTS BY AGE			
	TOTAL LF	**15-29:**	**30-49:**	**50+:**	**All Ages:**
1960:	403 400				
		4 890	4 020	1 210	10 120
1970:	501 300				
		6 600	5 700	790	13 090
1985:	697 600				
		6 300	11 000	900	18 200
1991:	806840				
		120	16 010	2210	18 340
1996:	898 550				
		-900	12 210	3660	14970
2001:	973 390				
		-1490	11 330	5220	15 060
2006:	1 051 680				
		1340	4380	6680	12 400
2011:	1 113 680				

TABLE 2.5(d)
BLACKS (TFR = 4,34):

		ANNUAL INCREMENTS BY AGE			
	TOTAL LF	**15-29:**	**30-49:**	**50+:**	**All Ages:**
1960:	3 058 000				
		28 930	34 470	5 660	69 060
1970:	3 726 000				
		49 460	45 120	13 070	107 650
1985:	5 340 000				
		-14 700	74 100	16 780	76 100
1991:	5 796 700				
		70 600	99 100	25 700	195 400
1996:	6 773 700				
		77 360	108 620	33 840	219 800
2001:	7 872 800				
		70 240	118 360	47 360	236 000
2006:	9 052 600				
		53 480	130 360	59 680	243 500
2011:	10 270 200				

Looking at the totals only we can identify the trends by means of the growth rates in Table 2.6.

Sources: Sadie, 1991, pp. 50, 58, 66, 74; 1994: p 25.

TABLE 2.6

ANNUAL GROWTH RATES OF THE MALE LF IN PER CENT

	1960-91	1991-2011	1960-70	1985-91	1991-96	2006-2011
Whites	1,70	0,40	2,4	0,9	1,0	-0,1
Asians	2,60	1,33	3,2	2,0	1,9	0,8
Coloureds	2,34	1,62	2,3	2,5	2,2	1,2
Blacks	2,08	2,90	2,0	1,4	3,2	2,6

Deviations from trend were caused by immigration in the case of Whites during 1980-85 which raised their growth rate, and, among Blacks by significantly increased school attendance since 1980 and by socio-economic and political conditions during 1985-91, both forces reducing the growth rate. But for these interventions the Blacks' rate would have been upwards until the beginning of the 1990's as it was in the case of the Coloured male LF, as a result of declining mortality not matched by a comparable diminution in the fertility rate. The effect of the deviation-inducing circumstances having stabilised, the Blacks' growth rate can be expected to be higher over the twenty-year period (2,9 per cent per annum) than during the preceding 31 year period 1960-1991 which contrasts with those of the other three groups. However, all four will be experiencing a slowing down or, among Whites and Asians, a continuation of the historical deceleration after 1991 or 1996. At the end of our projection period Blacks are expected to register a growth rate more than twice that of Coloureds and more than three times that of Asians, as a result of a delayed response to family planning programmes and urbanisation, while the ranks of the White LF will be reduced in the absolute sense, after decades of diminishing additions, from 23 000 per annum during 1960-70 to -1 700 in 2006-2011.

The divergent growth rates gave, and will give, rise to the following contributions by the four groups to the annual net increments in the LF:

	1960-70		1991-96		2006-2011	
	Number	**%**	**Number**	**%**	**Number**	**%**
Whites	23 000	21,6	14 910	6,4	-1 700	-0,6
Asians	4 360	4,1	5 250	2,2	2 590	1,0
Coloureds	10 120	9,5	18 340	7,9	12 400	4,8
Blacks	69 060	64,8	195 400	83,5	243 500	94,8
	106 540	100,0	233 900	100,0	256 790	100,0

The numerical preponderance of the Black population in the growth of the LF is manifest. Over the period of 31 years their contribution increased from 64,8 per cent to 83,5 per cent and it is very likely to increase to 94,8 per cent by the end of the projection period, by which time the predominant provider of entrepreneurial initiative (the White group) will be shrinking in size.

The age compositions of the annual increments, as set out in Tables 2.5(a), (b), (c) and (d), reflect the above differential growth rates and the forces shaping them. The White population, with a TFR below replacement level, after uninterrupted declines from its 1955-60 value of 3, 50, is the demographically oldest of the four population groups with accessions declining to the extent of engendering negative values in respect of the annual LF increments for the 15-29 age group after 1996, and for the prime age group as well as the all-ages total after the year 2006. By then this LF will be in the tertiary phase of the ageing process, the share of the 50+ age category increasing faster than the 15-29 portion is contracting, to induce a decrease in the relative size of the prime age group. The Asian and Coloured labour forces are following in the footsteps of the Whites, with shrinking numbers being added to the 15-29 age category. They are, however, still very much in the beneficial secondary phase of ageing while the relative size of their prime age group is expanding. The Black LF has entered this phase during the first half of the eighties only, and remains the most youthful of the four with additions to the 15-29 age category still on the increase. They, like the Coloured LF, have actually experienced some juvenescence over the 1960-1980 period as the result of declining mortality not neutralised by diminishing fertility.

The longrun effects of the movements detailed in Tables 2.5(a) to (d) are reflected in the point-of-time age structures for select dates in Table 2.7, which require no comment.

TABLE 2.7
AGE STRUCTURES OF THE MALE LF

		15-29	30-49	50+	Total
WHITES	**1960:**	30,8	44,9	24,3	100,0
	1991:	29,2	49,2	21,6	100,0
	2011:	23,4	50,3	26,3	100,0
ASIANS	**1960:**	46,2	40,7	13,1	100,0
	1991:	36,0	48,5	15,5	100,0
	2011:	29,8	49,6	20,6	100,0
COLOUREDS	**1960:**	45,7	38,2	16,1	100,0
	1991:	45,6	42,7	11,7	100,0
	2011:	32,9	50,7	16,4	100,0
BLACKS	**1960:**	45,6	37,4	17,0	100,0
	1991:	40,2	44,8	15,0	100,0
	2011:	35,9	47,5	16,6	100,0

2.6 ACCESSIONS TO AND DEPARTURES FROM THE LF

The increments in the LF discussed above are, of course, net additions, which are the outcome of the difference between entries into, and exits from, the LF. Attention to the two components is required not only for the insights they provide us with, but also because of the common flawed equation of the probability of a school-leaver or graduate obtaining a job with the net number of new jobs created. Even, as in the stationary labour market, the economy fails to create new job opportunities, but does not reduce the existing number of jobs, some accessions to the LF will be able to enter the jobs vacated by reason of the death and retirement of the incumbents, assuming similarity between skills required and offered. In Table 2.8 the ratios of departures to accessions (D/A) tell us the probability of acquiring a job in a stationary labour market with no intergroup mobility and no unemployment, the level of the latter determining the number of departures which emanate from males who do not have paid jobs and thus do not generate vacancies to which new accessions can aspire.

Below we ignore the discount for unemployment which would reduce the D/A ratio as an employment probability index in a stationary labour market, that of the Blacks diminishing by almost one-half if only the formal sector is taken into account.

TABLE 2.8

GROSS ANNUAL ACCESSIONS TO AND DEPARTURES FROM THE LF

	1991-1996			2006-2011		
	ACC.	**DEP**	**D/A%**	**ACC.**	**DEP**	**D/A%**
WHITES:	41 590	26 680	64%	35 950	37 650	105%
ASIANS:	9 310	4 070	44%	9 160	6 570	72%
COLOUREDS:	28 800	10 450	36%	31 270	18 870	60%
BLACKS:	272 340	76 940	28%	363 800	120 300	33%

These data inform us that a White male entering the labour market has a 64 per cent chance of obtaining a job according to the 1991-1996 conditions, and this probability rises to over 100 per cent at the end of the twenty-year period as exits begin to exceed entries. At the other end of the spectrum, Black males have a 28 per cent chance only, and the prospects do not improve meaningfully over the projection period. Of course, any new jobs created are tantamount to the strengthening of the numerator to raise the probability, while an increase in unemployment will reduce it. To equal the White males' probability in a stationary labour market, a dynamic economy is required to create new jobs for Blacks at a rate of 2,3 times the latter's LF departure rate.

The probabilities of Asian and Coloured males securing a job range between those of the Whites and Blacks, and will increase significantly to end up on 72 per cent and 60 per cent respectively, as a result of relatively low and diminishing fertility.

The inverse of the employment probability furnishes us with the coefficient of LF replacement as follows (Accessions per 100 Departures):

	1991-1996	2006-2011
Whites	156	96
Asians	229	139
Coloureds	276	166
Blacks	354	302

Because of the stagnation in the economy and job creation since 1982 - and at least up to the time of writing in 1998 - the theoretical beneficence, as discussed under Potential Manpower, of the demographic mobility inhering in such high values for the co-efficient as 276 and 354 among Coloureds and Blacks, respectively, is inoperative, and only the prejudicial attribute of having to provide for the 176 and 254 respectively, who cannot be accommodated in the 100 vacancies arising from departures through death and retirement, remains. While the co-efficient will be down to reasonable proportions for the three non-Black groups by 2006-2011, that of the Blacks will, at above 300, remain at a problem-ridden high value.

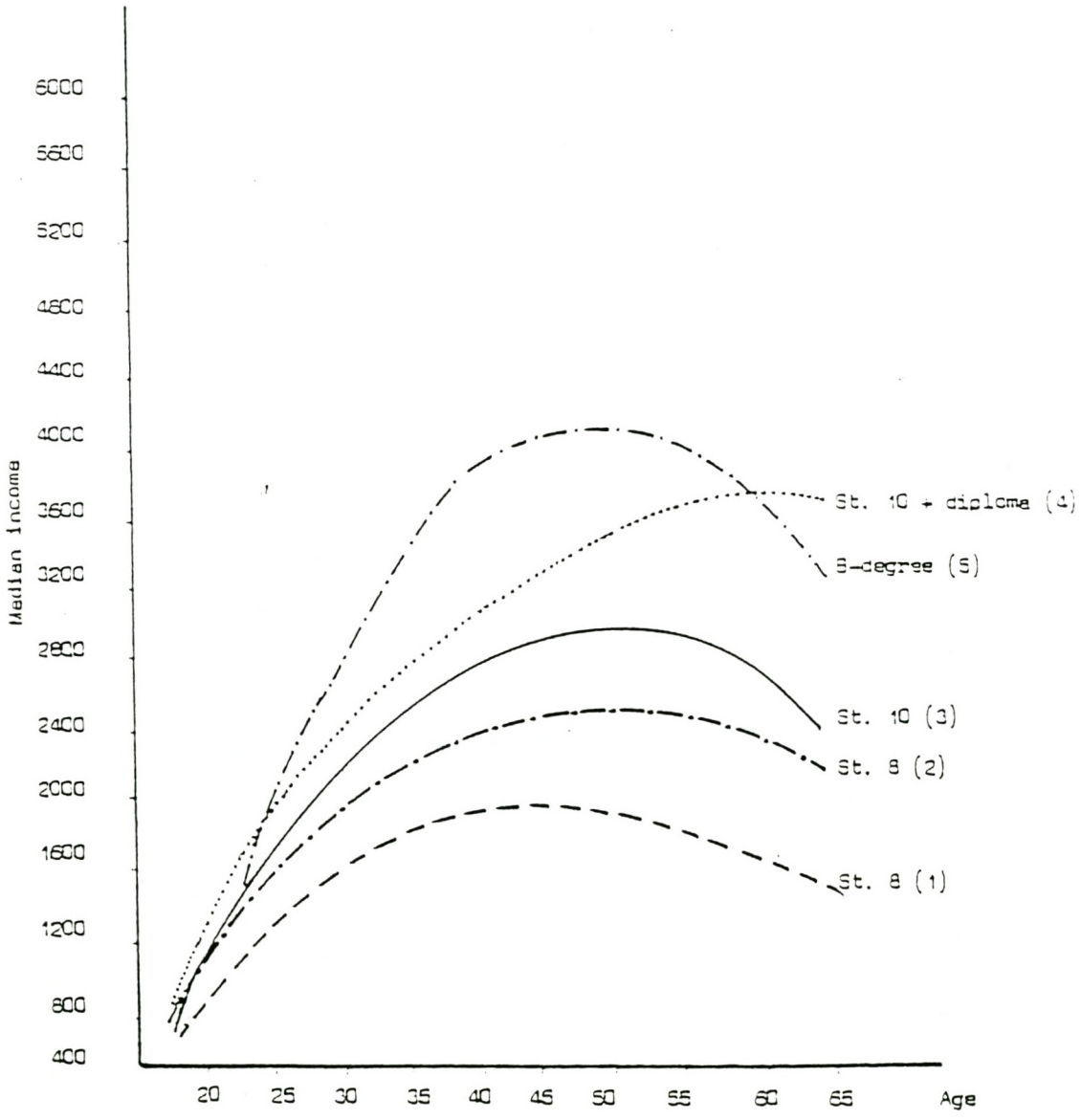
2.7 AGEING AND LABOUR PRODUCTIVITY

It may be maintained that as long as the prime age group in the LF is growing in relative size, the economically beneficial effect of ageing predominates and is therefore not a cause for concern. For example, at the opposing ends of the demographic spectrum we have a White prime age group which embodies on average 5,1 more years of learning and working experience than the Black group does, i.e. 26,2 vs. 21,1 years, and this should conduce, *ceteris paribus*, to some 24 per cent greater competence or productivity on the part of the former. But it is possible that the superiority in performance attaching to the greater number of years of experience may gradually disappear as the individual advances in age and is subjected to a biological process of involution. Again, even before the tertiary stage of demographic ageing has been reached there will have been a steady accumulation of numbers, in absolute and relative terms, who may experience some difficulties in the labour market because of the chronological age factor, which, in the eye of the employer, could conceivably be considered a proxy for biological age.

A possible link between productivity and biological ageing may be embodied in the age-earnings

FIGURE 2.5

EARNINGS BY AGE AND LEVEL OF EDUCATION



Source: Terblanche, 1973.

profiles diagrammed in Figure 2.5, which portray South African experience (Terblanche, 1973, p 12) but may be representative of many other countries (Hartog, 1976, pp 61-74; Blaug, 1976, p 837). The graphs are concave from below with the better educated and trained workers registering a steeper initial phase to reach a maximum level somewhere between age 45 and 55 after which they decline or level out. Based as they are on cross-sectional data there is some doubt about their validity at the upper end of the age scale, inasmuch as we are interested in the life-time earnings of a cohort as they proceed to the end of their LF career and not in the point-of-time earnings of a conglomerate of successive cohorts. Lacking the required longitudinal data these earnings have been simulated by means of a series of cross-sectional studies, which purport to show that the profiles should not dip at middle age but continue to rise until age 65. However, it is not inconceivable that if age-related earnings could be standardised for growth in the national product (or *per capita* national income) over time, it may be found that our age profiles above are representative of lifetime earnings as well (Clark, 1976, p 929). The learning curve may be cited as basis for this expectation. This curve, applied to the individual worker, describes his performance in routine tasks which are repeated (Corlett & Morcombe, 1970, pp 14-19), registers the decrease in time required as a result of repetition, and is convex in appearance. Inverted into a curve which regresses output on experience (represented by repetition), it will manifest some similarity with those in the Figure above in approaching some maximum level asymptotically.

The phenomenon may be linked to biological ageing in which the evolutionary process of the regeneration of the vital properties inhering in tissues and cells is being overtaken by involution or atrophy. Starting his/her LF career, endowed with innate ability and, perhaps, human capital and subject to training and learning-by-doing, the worker will experience evolution predominating at decelerating rates over time. During the period of senescence involution becomes the predominant force which can affect his/her productivity. Borrowing from the results of extensive psychological research some of the elements involved can be featured. (Welford, 1958; Ruhlen, 1945; Gintis, 1971; Suzuki, 1976; Guilford, 1967; Giniger, *et al.*, 1983; McEvoy & Cascio, 1989).

With regard to the sensory functions of man it is a well established fact that visual and auditory acuity diminishes with age. On the other hand it is maintained that what is perceived is more fully comprehended. It stands to reason, however, that the impediments must in many instances diminish their effectiveness as workers. Glasses and hearing aids can improve their visual and auditory accommodation. But perceptual activity includes an element of speed, and the lack of rapid response cannot be offset by means of such technical aids, although experience and persistence may to some extent effect a certain degree of compensation.

The progressive impairment of the homeostatic mechanism retards the regulatory response to changes in external environment such as would be induced by changes of temperature, or to

minor disturbances caused by muscular activity. This narrowing of the range of adaptation is responsible for a diminution in motor ability as expressed in skilled hand and foot movements, strength of grip or pull, etc. It is evident whenever the accent is on speed, and inasmuch as psychomotor ability involves a speed element, the majority of older people do not escape the decline wrought by the involutionary process. Persistence and practice or continued use of skill will, however, prevent a marked deterioration, or may compensate, even if not fully, for the original lack of promptness of response. Older persons have a more rigid approach than younger ones to tasks set to them, with the result that they require more time per task. When working at their own speed the decrement in their standard of performance over time is less. Where they have to work according to a time schedule they evidently tire sooner and the margin of superiority of the younger workers increases with the duration of the task. This superiority is also the greater the more complicated the tasks. In those not making unusual demands the older subjects do comparatively well. In so far as they are cautious, afraid of making mistakes, they are more deliberate and accurate. Less effort is wasted. This is, of course, an advantage where expensive material and machinery are involved.

Because of the impairment of the memory faculty older people need more time in committing something to memory, but they tend to make fewer mistakes than younger people who memorise more easily. A distinction is to be recognised between rote memory, which does not show any sudden deterioration before the eighties, and the process of assimilation, the decline in which renders the older subject less able to cope with the memorising of facts.

Although it would appear from various experiments with intelligence tests that there is a decline in intelligence after a youthful age, no irrefutable conclusion is to be drawn. Older people seem to retain some intellectual abilities while undergoing a deterioration in others. Some experiments have shown a retardation in verbal fluency, while in others no or no significant decline has been found. The results are apparently also dependent on the type of test. It is being contended that the tests may not be evaluating the same mental ability at different ages. The root of the problem is probably to be found in the difficulty of giving precise meaning to the term "intelligence". A person, as he grows older, may become wiser and in this sense more intelligent, though he may have less ability than he once had. Also, one has to distinguish between capacity and ability. A person may lose the latter while retaining the former, or vice versa. These tests, however, do show that where speed constitutes an important element, older people display a similar decrement in performance as in motor ability. They are more circumspect in their intellectual operations, and have greatest difficulty where they have to break away from established mental habits and to adapt themselves to new situations.

The ability to learn is a function not only, nor even primarily, of age per sé but also of a person's inherent capacity, his training, the way his abilities have been utilised over the years, his experience and habits and his attitude toward his work. Disentangling the effects of each factor is

not always possible, especially since some of the other factors mentioned usually reinforce the degenerative effect of ageing. Thus a person may have fallen into a mental rut because of specialisation, having worked at one particular task the greater part of his life. The full range of his potentialities never becomes exercised; and ability deteriorates as a result of disuse, even though the capacity is retained. If in addition the older person lacks interest or enthusiasm for his work, because the attribute of curiosity, which characterises youth and which evokes investigative behaviour, has waned, or because he is subjected to less economic and social pressure, it is to be expected that his learning ability will be, or will appear to be, inferior when compared to that of younger persons.

Performance in learning task experiments falls continuously with age. At first there is a slowing down, then the standard of accuracy declines, after which both speed and accuracy decline. Variability increases with age; which means that the deviation from the mean, or average, performance is greatest in the upper age brackets. Some older persons show ability equal to that of their younger colleagues, while others perform much worse. The diminution in learning ability is correlated with the degree of reorganisation required of existing habit patterns. Whereas younger workers would allow a learning task to dictate their method of approach, older persons are inclined to approach it with certain preconceptions. Their inability or unwillingness to accommodate new situations is demonstrated by, amongst others, the difficulty experienced in unlearning something. They tend to be more conservative and traditional in their beliefs and to resist changing their beliefs. Flexibility is reduced. Inasmuch as the mobility of the LF between sectors of the economy is reduced, the economy will lose some of its flexibility, and growth may diminish. Costs will rise as the returns to the retraining of labour decline with age. The downward mobility of labour - the relegation to lower status jobs as age increases - can act as a countervailing factor, but this would require a destigmatisation of such relegation.

As a compensatory factor their greater experience and wider range of habits which can be brought to bear upon a problem can be pointed out. It is also to be added that whether or not the learning ability of an employee remains functional will depend to a great extent on the growth of the firm in which he works. If the latter is continually developing, changing the variety of its products and its methods of production or venturing into new fields, so will the employee grow and develop with it. If it stagnates, the worker will lose his adaptability.

Judgement and reasoning ability are the two characteristics which offer the greatest resistance to deterioration, and they reach their peak latest of all abilities, and it may be that the greatest intellectual maturity is reached when those physiological functions which determine motor ability have reached an advanced stage in the involutionary process. This is to be expected in view of the fact that judgement and reasoning are based on experience and knowledge which accumulate over the years, while the deterioration is the smaller the more complex the psychological function. This points to the conclusion, borne out in practice, that work requiring

great skill can be effectively performed at an advanced age if it is unconstricted by demands of speed or amount. Thus it is also that creative ability knows no age, although the outstanding performances by geniuses at high ages cannot be held up as examples in this connection since they are by no means representative of the average older person.

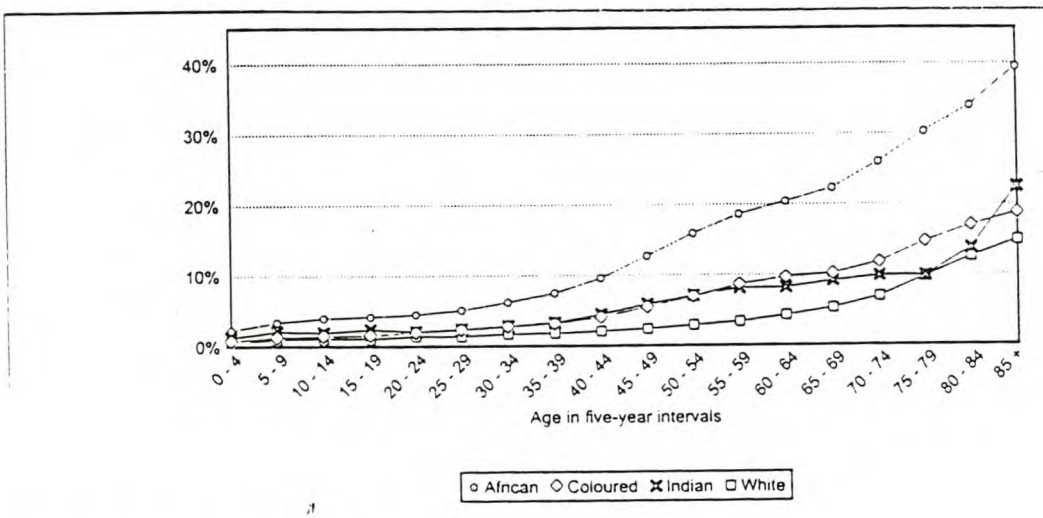
Most of the age-related decrements noted above seem to be located in the receptor mechanism which deals with the organisation of incoming data, and not in the effector mechanism which is responsible for the transition from perception or assimilation to action. The former can be associated with the cognitive characteristics, and the latter with the affective characteristics (the propensity to respond to demands). If the latter is accorded priority rating it is learning-by-doing and experience that come into their own, particularly when coupled with the attribute of loyalty and devotion to duty. While older workers are accordingly most deficient when the execution of a task conflicts with established habits, and especially if the latter are required to be unlearned, they are, on the other hand, at their best whenever time-stress is absent, and they are working within well-defined limits, when they can use their accumulated experience and problemsolving ability and when a minimum of motor ability is required.

If the above analysis is valid it may offer an explanation for the perceived or discovered curvilinear association between productive performance and age (unfortunately, invariably, on the basis of cross-sectional and not longitudinal data) and, among a family of age profiles, the dipping or flattening out of those of manual workers at an earlier age than the profiles of white collar workers and, among the latter, those of the lesser educated sooner than of the more highly educated. The contrast could, at least in part, relate to manual dexterity (deteriorating after a certain age) versus increasing wisdom. However, two researchers found that among the 65 studies, with 96 independent samples, identified by them, 56 reported a positive correlation, 38 a negative correlation and 2 a zero correlation between age and performance. Their own meta-analysis of these studies led them to the conclusion that age and performance appeared to be generally unrelated (McEvoy & Cascio, 1989, pp 11-19; also Clark & Menefee, 1980). They do sound some *caveats* though: the relationship may be curvilinear and not linear as assumed in their meta-analysis; the performance of older workers may reflect the effect of selective retention of older workers; and the data are cross-sectional (instead of longitudinal) in character. Uncertainty prevails.

Juxtaposing psychomotor abilities and wisdom (judgement, reasoning, experience) the former can be said to be required pre-eminently by lesser developed communities (LDCs with smoke-stack industries, blue collar jobs), while the more developed economies (MDCs) where advanced technology and the knowledge industry prevail, the latter attribute may be the more appropriate. And, to this extent, demographic forces and requirements of economies appear to be synchronised. However, this does not necessarily confer a comparative advantage on LDCs, because of the substitutability of technology and capital for labour.

In the absence of direct statistical evidence on morbidity by age as a measure of physiological retrogression, we can have recourse to the age incidence of disability on which information has been collected in the 1996 census, after having been omitted in the 1955 and 1991 censuses. Statistics South Africa's 1996 graphic portrayal is reproduced in Figure 2.6.

FIGURE 2.6
PERCENTAGE OF DISABLED IN EACH AGE CATEGORY BY POPULATION GROUP



* Excluding institutions and those who did not specify their age

Source: SSA, 1998, p 2.24

Even while the intergroup picture appears to be slightly distorted (cf. CSS, 1980, pp 305-311) by the exclusion of institutions, the overall message is clear: the incidence of disability is positively correlated with age. The probability of disablement among the age group 55-64 is on average (for the four groups together on a weighted basis) three times as high as that of age group 20-24. The data on work disability gathered by the United States National Health Survey reveal a progressive upward movement of rates by age, with those of the 68-70 age group two to four times higher than those of the 50-52 year olds, depending upon the physical demands made by the jobs (Feldman, 1986, ch XVII). The duration of work disability also increases with age, being twice as long for those aged 55-64 than those 18 to 44 years old (Metropolitan Life, various issues).

The fragmentary data available on morbidity underscore the tendencies inhering in the above statistics (Caldwell, *et al.*, 1990, Vol 1). While older workers are less likely to get injured in the work place, they experience proportionately more permanent impairments than younger ones, and healing periods in the case of temporary disablement are longer.

The adverse attributes associated with ageing as discussed above provide grounds for differentiating between young and elderly workers. But the latter have, in addition, to contend with discrimination i.e. treatment based on prejudice or stereotyping. This is particularly true of individuals who do not conform to the mould in which they have been cast in the thinking of employers. In the mid-twentieth century the chairman of the New York State Joint Legislative Committee on Problems of the Ageing elicited information from fifty-nine countries about the treatment meted out to older workers, and found: "In seeking a job the older person finds himself at a disadvantage *vis-à-vis* the younger person, whether he be in the Orient or the West - whether in a statist economy or free enterprise economy or mixed economy, whether .... There is no evidence available that indicates that anywhere in the world employers generally are free from prejudice against the hiring of older workers" (Abrams, 1952, p 70). Since then discrimination has diminished in intensity but has not disappeared (Clark, 1980), a pointer to which is the 1978 Act of Congress which raised to 70 the minimum age at which the discharge of a worker on the basis solely of chronological age was permitted.

The outcome of this situation in the labour market is the discouraged worker.

2.8 IN RECAPITULATION

The demographic mobility of a LF inhering in a high fertility, rapidly growing population, or population group, imparts economic adaptability to it which can facilitate economic change and growth. However, an economy lacking in vitality, and particularly when it is hamstrung by trade union action – as has been the situation in South Africa since the beginning of the 1980s – does not convert this potentially beneficial attribute into actual economic performance. In consequence, in the LF context, there is no economic merit in the rapid growth and the size of the numerically predominant, and youthful, Black population group in South Africa. A 354 coefficient of LF replacement (accessions per 100 departures), compared to 156 for Whites, spells an impediment to the attainment of reasonable levels of employment.

The observed declines in LFP reduces the statistic which measures numbers of employed, but brings no relief to the problem of providing sustenance to the population at large.

While all four ethnic groups will be experiencing the secondary, theoretically beneficial, stage of ageing (i.e. the LF component of the population is expanding) the White group because of its history of low fertility levels, is due to enter the tertiary stage during the first decade of the twenty-first century, in which the LF component will shrink. Since 1996 the accessions have been in absolute decline, and after the year 2006 only the 50 years and older section of their LF is likely to expand. Insofar as manufacturing processes require manual dexterity, visual and

auditory acuity, this ageing will have an adverse effect on productivity. This is not likely to happen, though, if the white collar professional service sector, in which experience, expertise and judgement are required, becomes or remains a leading GDP generator.

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APPENDIX A

1991 WORKING LIFE TABLE - BLACK MALES

x	w_x	L_x (l_o=1000)	$Lw^1{}_x$+	$Tw^1{}_x$	$lw^1{}_x$	$^o ew_x$	$^o e_x$	$^o e_x$-ew_x
15-19	,323	4 466	4 211	36 577	836	43,8	49,3	5,5
20-24	,674	4 406	4 155	32 366	822	39,4	44,9	5,5
25-29	,875	4 316	4 070	28 211	803	35,1	40,6	5,5
30-34	,932	4 207	3 967	24 141	781	30,9	36,5	5,6
35-39	,943	4 074	3 842	20 174	753	26,8	32,5	5,7
40-44	,941	3 919	3 688	16 332	718	22,7	28,5	5,8
45-40	,940	3,712	3 489	12 644	672	18,8	24,7	5,9
50-54	,920	3 441	3 166	9 155	603	15,2	21,2	6,0
55-59	,878	3 106	2 727	5 989	508	11,8	17,9	6,1
60-64	,689	2 681	1 847	3 262	336	9,7	14,9	5,2
65-69	,420	2 194	921	1 415	177	8,0	12,2	4,2
70-74	,303	1 631	494	494	77	6,4	9,8	3,4

+ To obviate the statistical probability of a rise in working life expectancy emanating from the increase in LFP between age 15 and age of maximum participation, the LFPR of the latter is assumed to apply to the lower ages as well.

APPENDIX B

1991 MALE LFPRs (%)

	WHITES		ASIANS		COLOUREDS		BLACKS	
	1960	**1991**	**1960**	**1991**	**1960**	**1991**	**1960**	**1991**
15-19	36,7	24,5	51,4	28,1	82,9	36,8	79,3	32,3
20-24	91,9	80,0	92,5	85,4	97,5	84,2	96,5	67,4
25-29	98,4	96,5	97,2	95,5	98,6	91,6	98,9	87,5
30-34	99,3	97,6	99,2	96,1	98,9	92,3	99,4	93,2
35-39	99,4	97,9	99,4	96,4	98,6	92,6	99,4	94,3
40-44	99,1	96,8	98,5	95,4	98,3	91,2	99,3	94,1
45-49	98,7	96,6	98,0	94,0	97,9	89,5	99,2	94,0
50-54	96,8	93,2	94,5	89,7	95,2	84,3	98,2	92,0
55-59	92,5	83,6	88,1	82,3	90,9	78,0	95,1	87,8
60-64	86,0	58,7	76,7	64,0	81,6	51,2	91,5	68,9
65-69	71,7	35,8	65,3	38,0	68,9	26,8	85,4	42,0
70-	47,0	28,2	55,5	28,8	56,6	15,9	74,4	30,3
Gross Yrs of EA Life	50,9	44,5	50,8	44,7	53,3	41,7	55,8	44,1
Net Yrs of EA Life	43,3	39,9	42,4	38,4	42,6	34,1	42,1	36,4
Difference	7,6	4,6	8,4	6,3	10,7	7,6	13,7	7,7

CHAPTER 3

THE FEMALE LABOUR FORCE

3.1 LF PARTICIPATION

While there are several reasons why the female LF should be separately treated of, the outstanding one is that most females, at one time or other stage of their lives, assume the homemaking function, more often than not accompanied by the exercise of the reproductive function, which adds an extra dimension to the choice between LFP and non-participation. The frequency of reproduction is a determinant of the amount of time that can and/or will be spent in the wage labour market. That participation in family formation tends to be an impediment to LFP – even if not universally – is, or has been, manifested in the levels and age profiles of female LFPRs, as portrayed in Figures 3.1(a), (b), (c) and (d). Their content can be felicitously interpreted in conjunction with the longitudinal LFPRs by birth cohort, as detailed in Table 3.1.

TABLE 3.1

LABOUR FORCE PARTICIPATION RATES OF COHORTS OF WOMEN ADVANCING IN AGE, BY POPULATION AND AGE GROUP, 1925-1959

	Age Group							
Birth Cohort	15-19 %	20-24 %	25-29 %	30-34 %	35-39 %	40-44 %	45-49 %	50-54 %
Whites								
1925-1929	-	46,3	28,9	27,6	32,8	38,8	41,5	39,0
1930-1934	42,0	48,3	30,5	31,2	36,5	42,9	46,2	42,9
1935-1939	37,6	50,3	34,6	34,7	41,8	46,9	49,5	
1940-1944	33,1	54,1	38,7	40,8	47,1	53,5	58,0	
1945-1949	33,0	58,0	45,3	46,9	53,4	62,2		
1950-1954	33,0	59,9	51,8	53,4	63,2			
1955-1959	29,6	61,8	59,1	64,3				
Asians								
1925-1929	-	8,5	7,7	8,5	11,8	13,6	15,3	11,3
1930-1934	8,7	11,3	10,2	12,5	15,4	18,8	20,0	17,1
1935-1939	10,3	14,0	15,6	16,4	20,9	23,9	23,3	
1940-1944	11,8	13,6	21,0	23,0	26,4	28,7	26,7	
1945-1949	17,7	27,2	26,6	29,6	33,1	37,9		
1950-1954	23,5	34,7	32,2	36,0	41,3			
1955-1959	24,8	42.2	41,1	45,7				

Birth Cohort	Age Group 15-19 %	20-24 %	25-29 %	30-34 %	35-39 %	40-44 %	45-49 %	50-54 %
Coloureds								
1925-1929	-	55,6	40,6	36,8	37,9	38,1	39,3	35,5
1930-1934	64,8	56,6	42,7	39,4	40,5	41,7	41,5	35,9
1935-1939	65,9	57,5	44,9	42,0	44,9	45,3	42,2	
1940-1944	67,0	58,8	47,0	46,2	49,3	49,3	48,9	
1945-1949	63,6	60,1	52,0	50,3	53,0	56,1		
1950-1954	60,1	62,8	57,0	58,0	62,7			
1955-1959	48,7	65,4	66,3	67,7				
Blacks								
1925-1929	-	31,6	26,7	25,4	28,1	30,1	35,8	38,4
1930-1934	29,0	32,2	26,2	29,8	32,0	36,5	42,2	38,4
1935-1939	30,0	31,7	31,3	34,1	37,7	42,8	42,4	
1940-1944	32,2	37,1	36,3	40,0	43,4	47,3	50,3	
1945-1949	32,6	42,5	41,8	45,9	48,9	55,0		
1950-1954	33,0	42,1	47,2	50,0	58,2			
1955-1959	26,7	41,8	49,0	59,1				

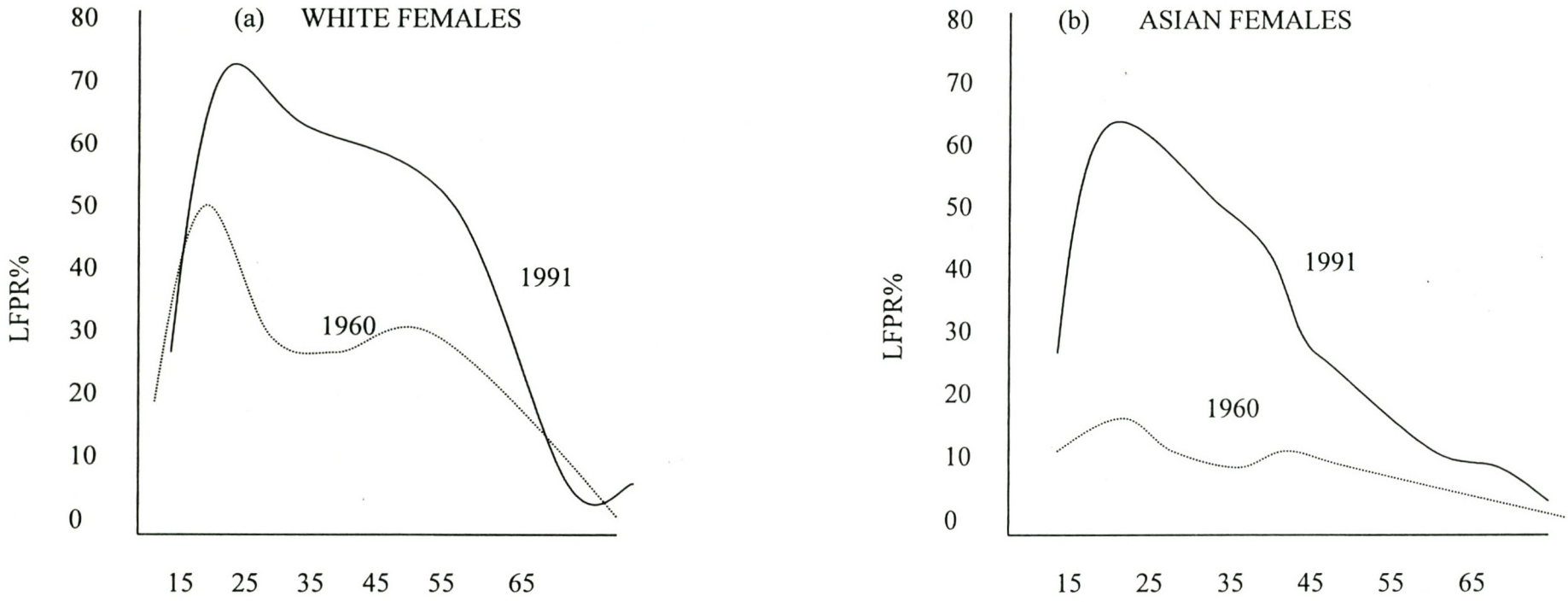
Source: Inferred from Sadie, 1991, 1994.

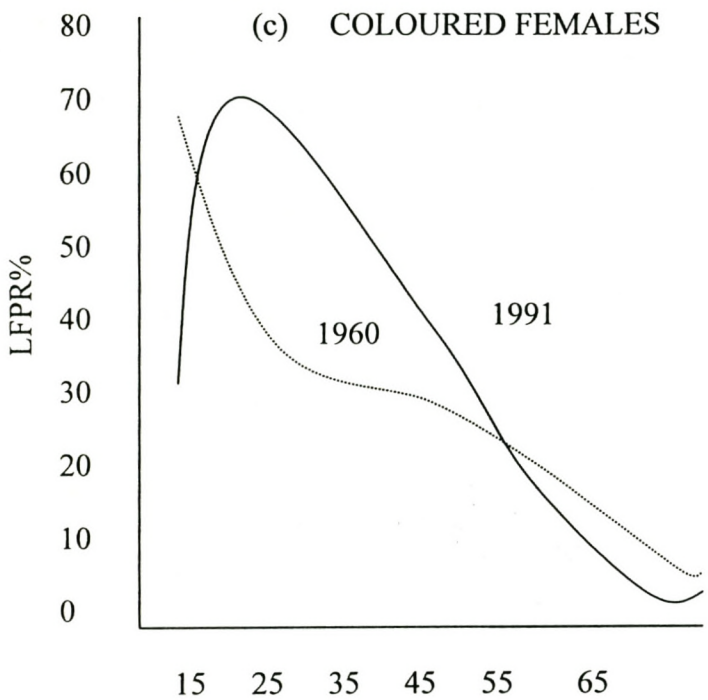
We can broadly distinguish three types of age patterns of LFP as reflected by the 1991 data:

(i) The Black females' domelike profile, rather similar to that of males, in which changes in marital conditions with advancing age do not seem to feature. Starting from a somewhat shapeless, gradually downward moving curve in 1960, the prime age category's values moved up to form a fairly broad peak. The intra-generational LFPRs in Table 3.1 reveal a slight depression at age 25-29 for the birth cohorts of 1945-49 and earlier years. The later generations show a seemingly uninterrupted work career to peak at around age 50. The remarkable rise in LFP is associated with increasing urbanisation and the border industries policy of the pre-1944 government.

(ii) The Asian and Coloured female LFPRs trace out similar patterns, with a peak at age 25-29 followed by a steep slope. The latter's level is the higher, having a much longer tradition of participation in the wage labour market, as can be observed by comparing the 1960 curves. This comparison demonstrates the effect of differences in social customs and the waning of their influence. The longitudinal LFPRs of Coloured women have been registering a diminution of the dip at age 30-34, and for the birth-cohorts of 1950-54 and later years the movement has been uninterruptedly upward from age 15-19 to beyond age 30-34. Those of the Asian women showed a depression at age 25-29 for the 1925-29 and 1930-34 birth cohorts, no break in the upward movement for the next two birth cohorts,

FIGURE 3.1
FEMALE LF PARTICIPATION





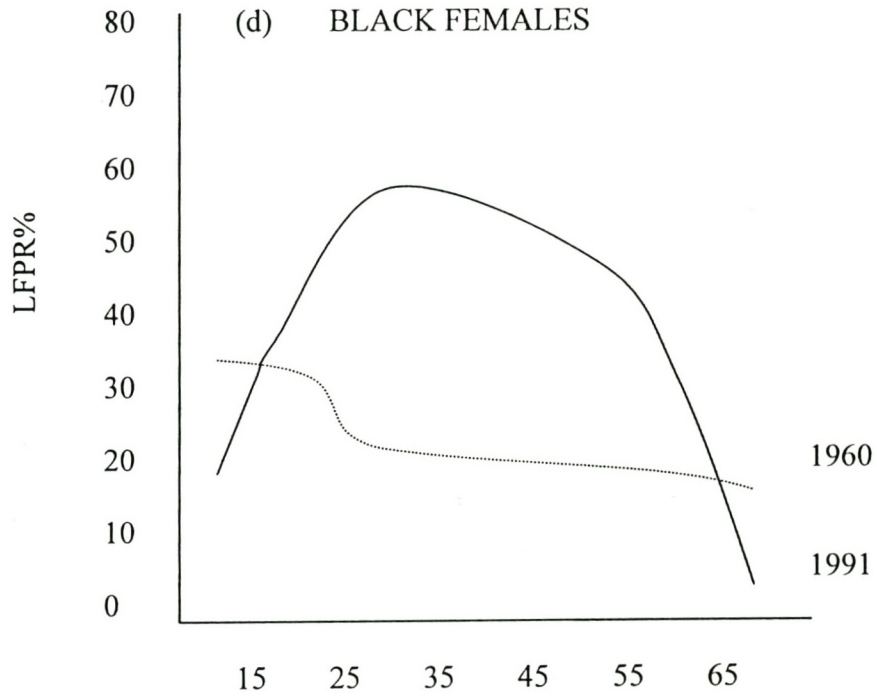
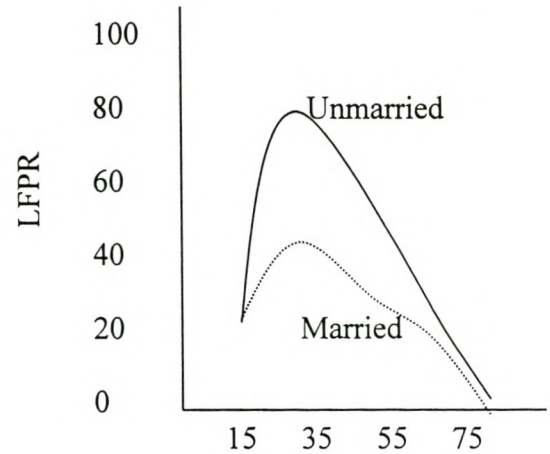


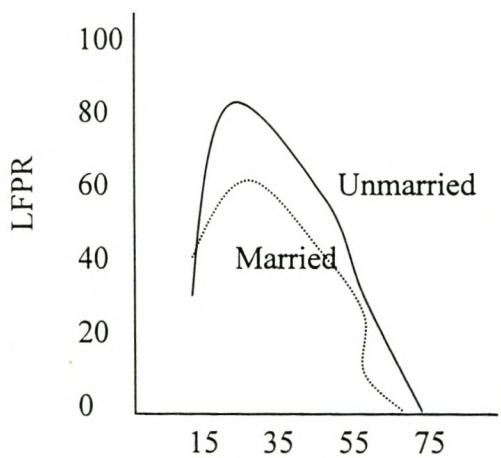
FIGURE 3.2
LFPRs OF MARRIED AND UNMARRIED WOMEN

(a) 1991 White Female LF

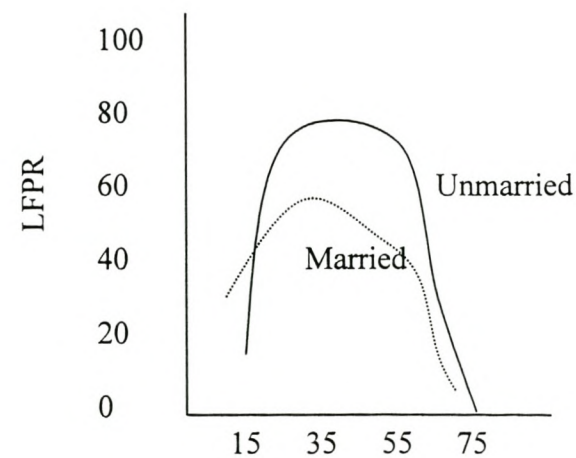
(b) 1991 Asian Female LF



(c) 1991 Coloured Female LF



(d) 1991 Black Female LF



after which the break reappears and increases in size over the lives of the next two cohorts, while the 1955-59 cohort registered a reduction in the degree of interruption of the labour market career. The rise, between 1960 and 1991, in their LFP is remarkable.

(iii) The White females' profile differs from those of the previous two groups in that the LFPRs exhibit a deceleration between ages 35 and 45 in the downward movement; after a peak at age 20-24 (or 20-29) and an abrupt decline between age 25-29 and 30-34. In 1960 this deceleration had induced a decided secondary peak at age 35-39, but which had all but disappeared by the time of the 1985 census. The intragenerational LFPRs show a gradual reduction over time in the intensity of the break in a cohort's LF career, the reduction in the LFPR between age 20-24 and 25-29 having declined from 17,8 percentage points for the 1930-34 birth cohort to 2,7 for the 1955-60 cohort. This may be the prelude to a transition to a positive difference in the successive rates.

The above trends demonstrate that (a) there has been a phenomenal increase in the LFP on the part of women. The number of years spent by the average woman in the LF increased as follows between 1960 and 1991: Whites from 15,5 to 27,5 years; Coloureds from 20,5 to 25,9; Asians from 4,9 to 17,1; and Blacks from 14,7 to 22,6. (b) The degree of intermittence in their LFP, associated with homemaking (marriage, childbearing, childrearing, house work). has attenuated appreciably.

3.2 MARITAL STATUS AND ECONOMIC ACTIVITY

To identify the origin of the intermittence we have to enquire into the LFP according to marital status.

In Figures 3.2 (a), (b), (c) and (d) the age patterns of LFP of married and nonmarried women are compared. Those of the latter are affected by the composition of the nonmarried, made up of never married, cohabitating, widowed and divorced women. As a majority in this category, and exhibiting higher LFP than the other three components - after the analogy of American, Canadian, British and German experience (Killingsworth & Heckman, 1986, pp 106-109) in the absence of data for South Africa - the never married dominate the scene. Our diagrams demonstrate a higher propensity to participate in the LF by non-married than by married women. The latter, however, start off (15-19) at a level considerably higher than those of unmarried women, whose age profiles are a narrower version of the males' pattern, in that their rates after

the peak taper off more rapidly, indicating earlier retirement than males.

The percentages of married women among those 15 to 74 years old have been changing as follows:

	1960	1970	1980	1985	1991
	%	%	%	%	%
Whites	66,7	66,7	65,1	60,8	62,8
Asians	56,6	55,9	59,7	59,2	58,2
Coloureds	54,8	45,2	45,3	42,3	40,9
Blacks	62,9	54,1	-	-	38,9

The Asians excepted, it would seem that the propensity to marry has been on the decline, even while a *caveat* has to be sounded that the somewhat drastic diminution after 1980 in percentages married could contain an element of a statistical aberration. Nevertheless, accepting that some diminution has occurred, this would have raised the LFPRs of the total female population since the higher participators have increased in relative size. However, the contribution of this factor has been a good deal less than that of the rise in LFP on the part of married women.

Unfortunately, except for the 1991 data diagrammed in Figures 3.2 above, our historic data on married women's participation are confined to White women for 1960, 1970, 1985 and Coloured women for 1980, 1985. The average gross years of EA life of the latter group increased by 5,4 (from 17,0 to 22,4) between 1980 and 1991 compared to 2,6 years for the unmarried section. The comparable magnitudes with regard to White females are as follows:

	1960	1970	1980	1985	1991	Increase 1960-91
Married	9,8	14,7	19,0	21,0	24,7	14,9
Non-married	33,6	34,9	32,2	34,0	35,1	1,5

While there is no real trend to be observed in the series for the nonmarried, and the difference between the first and last Figure is 1,5 only, the average EA life of White married women rose by 14,9 years (or 152%). The historic data allow us to extract LFPRs for consecutive generations (represented by birth cohorts) as in Table 3.2.

FIGURE 3.3
LFPRs OF WHITE MARRIED WOMEN
BY BIRTH COHORT

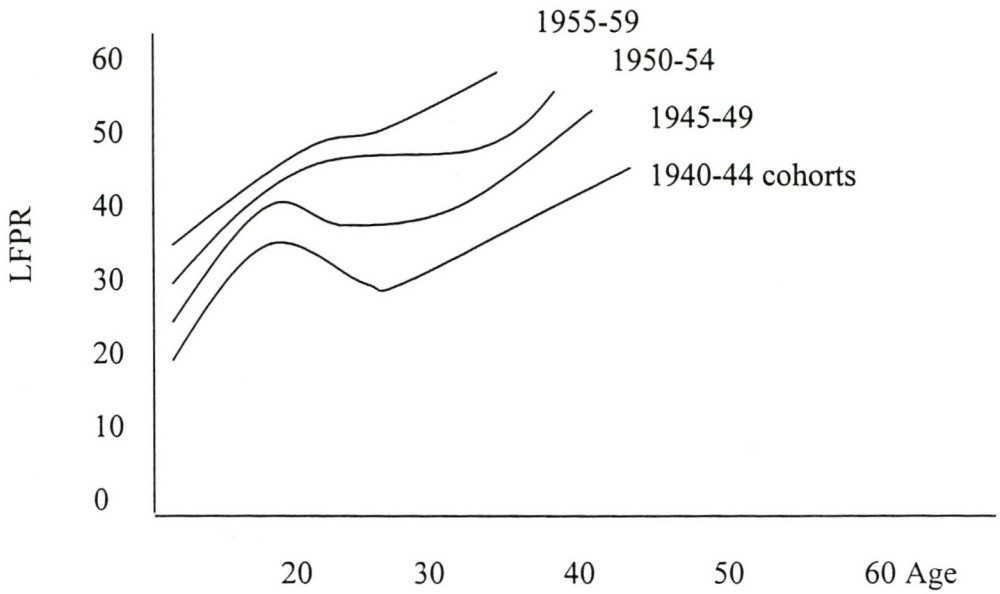


TABLE 3.2

LFPRs FOR WHITE WOMEN BY BIRTH COHORT

	Married Birth cohort				Nonmarried Birth cohort			
At age	1940-44	1945-49	1950-54	1955-59	1940-44	1945-49	1950-54	1955-59
15-19	18,9	25,0	31,1	33,4	34,3	33,9	33,1	27,8
20-24	32,9	39,6	44,4	49,1	85,3	84,5	79,2	73,8
25-29	30,1	37,4	44,7	52,2	88,0	84,0	80.2	83,2
30-34	35,0	40,5	45,3	56,7	85,0	84,7	94,1	90,3
35-39	41,9	46,9	55,4		82,0	89,6	96,8	
40-44	48,2	57,0			80,7	84,0		
45-49	53,7				70,5			

Figure 3.3 confirms that, as quantified in Table 3.2, the depression described by the LFP of the married women born in 1940-44 and 1945-49 at age 25-29, to induce a second peak higher than that at age 20-24, gave way to a sideways movement (slightly upwards) among the 1950-54 generation and was replaced by an uninterrupted upward movement as from the initial age of entry in the case of the 1955-59 (and probably also later) birth cohort. The 1991 (point-of-time) dip and second peak displayed by the diagram for married White women are the outcome of differential movements in LFP by successive generations of women. The incomplete data for Coloured married women show only upward movements for those 15 to 34 years old in 1980, but slight declines in 1985 for age groups 35-39 and 40-44 when they become five and ten years older. For them, as for Asian and Black women, the age profiles of LFP among married and nonmarried females are very similar, and in time to come this would probably also be true of White women.

While we cannot declare that intermittence of female LF careers has disappeared in the case of individual married women, the aggregate picture is that of uninterrupted labour market activity. It is possible that increasing first- and second-time accessions to the labour force outnumber departures from the LF, apart from an increasing non-interruption of married women's professional careers. In the United States it was found that "increasingly, mothers with younger and younger children are entering the labour force" (Da Vanzo & Rahman, 1993, p 362).

A comparison of the average gross years of EA life of married and nonmarried women indicates that marital status has the greatest effect among White females and the least among Blacks, as follows:

GROSS AVERAGE YEARS OF EA LIFE, 1991

	Married	Nonmarried	Difference
Whites	24,7	35,1	10,4
Asians	14,0	22,7	8,7
Coloureds	22,4	29,0	6,6
Blacks	21,9	27,2	5,3

Also, only among Whites does marital status make a difference to the age of peak participation, unmarried females reaching it sooner than married women, when judged in intragenerational terms. (Point-of-time intergenerational data show the first peak for married women to be reached at a lower age.)

3.3 NUMBERS

In Table 3.3 are assembled the data on size of the female LF for the years in which the population censuses were conducted as well as projected numbers for 2006 and 2011 – derived by multiplying the LFPRs with the number of females per age group – and the average increments per intercensal year for each of three age categories. The latter differ from those of males in that the prime age category starts and ends five years (of age) earlier.

TABLE 3.3

SIZE AND GROWTH OF THE FEMALE LF

Year	Size	Annual increments by age category				
		15-24	25-44	45+	Total p.a.	Growth p.a. %
Whites						
1960	300 960					
1970	460 050	4 790	7 150	4 520	16 460	4,3
1980	643 880	1 920	12 850	3 580	18 350	3,4
1985	773 830	3 510	17 190	5 290	25 990	3,7
1991	956 400	2 070	17 940	10 420	30 430	3,6
1960-1991						3,9
2006	1 097 410					
2011	1 110 660	-3 300	920	5 030	2 650	0,24
Asians						
1960	13 240					
1970	35 920	1 190	980	180	2 350	10,9
1980	69 120	990	1980	350	3 320	6,8
1985	91 430	990	2 750	720	4 460	5,8
1991	124 080	1 130	3 210	1 100	5 440	5,2
1960-1991						7,5
2006	190 660					
2011	210 460	-170	2 650	1 480	3 960	2,0

Year	Size	Annual increments by age category				
		15-24	25-44	45+	Total p.a.	Growth p.a. %
Coloureds						
1960	181 230					
1970	258 790	3 610	3 360	1 050	8 020	3,6
1980	370 130	2 730	6 880	1 520	11 130	3,6
1985	471 350	6 750	12 220	1 270	20 240	5,0
1991	602 120	1 720	16 880	3 190	21 790	4,1
1960-1991						3,95
2006	802 520					
2011	845 240	-2 650	4 810	6 380	8 540	1,1
Blacks						
1960	868 890					
1970	1 360 570	20 950	26 840	3 070	50 860	4,7
1980	2 163 870	9 440	49 900	20 990	80 330	4,7
1985	2 681 360	23 990	65 610	13 900	103 500	4,4
1991	3 560 600	21 430	98 430	26 670	146 530	4,8
1960-1991						4,7
2006	6 453 100					
2011	7 609 500	32 320	135 400	63 560	231 280	3,3

Sources: Inferred from Sadie, 1991 and 1994.

The data in Table 3.3 bear out the remarkable growth that has taken place in female LFP. At rates varying from 3,9 per cent (Whites) to 7,5 per cent (Asians) per annum for the 1960-1991 period, the increase in LF members was greatly in excess of population growth. The relative shares of the two magnitudes in the expansion of the LF for females, emphasised by juxtaposing the experience among males, are as follows:

	Males 1960-91		**Females 1960-91**	
	Change in LFP+ %	Population Growth %	Change in LFP %	Population Growth %
Whites	-19,7	100	+63,2	36,8
Asians	-15,4	100	+82,2	17,8
Coloureds	-29,4	100	+28,5	71,5
Blacks	-36,7	100	+53,8	46,2

+ Loss due to decline in LFP expressed as a percentage of what the LF size would have been in the absence of the reduction in LFPRs.

It is evident that only in the case of Coloured women, who started the thirty-one year period with a high level of participation, has population growth (inclusive of age composition changes) been

of greater significance than the rise in LFP. For Asian women its contribution has been as little as 17,8%, the increase in LFP registering a share of 82,2 per cent in the growth of numbers. By contrast, among males population growth has been responsible for the total LF growth, the decline in LFP having caused losses ranging from 15,4 per cent among Asians to 36,7 per cent among Blacks.

Another prominent feature is the very pronounced change, as between 1960-91 and the expected 1991-2011 situation, in the relative size of the Black and Non-Black female LF increments, as follows:

	1960-1991	1991-2011
Non-Blacks	1 187 170	483 760
Blacks	2 691 710	4 048 900

For the first period it was 2,3 to 1. It is projected to increase to 8,4 to 1, to register a 89 per cent share in the female LF growth. This is not surprising bearing in mind the results of the analysis of the male LF.

Our projected 1991-2001 LFPRs provide for a continuation of LF losses due to this magnitude on the part of males - ranging from -0,6 per cent for Blacks to -3,8 per cent for Whites - and of gains in the case of females amounting to 44 per cent for Whites, 61 per cent for Asians, 10 per cent for Coloureds and 35 per cent for Blacks. Accordingly, the share of females in the total South African LF, which has increased from 23,4 per cent in 1960 to 38,6 per cent in 1991, will continue to do so to reach 42,3 per cent by the year 2011. This is evident from the data in Table 3.4.

TABLE 3.4

TOTAL (M + F) LABOUR FORCE

	Non-Blacks	Blacks	Total
Males			
1960	1 404 000	3 058 000	4 462 000
1985	2 341 700	5 340 000	7 681 700
1991	2 558 870	5 796 700	8 355 570
1996	2 751 350	6 773 700	9 525 050
2001	2 892 250	7 872 800	10 765 050
2006	3 009 590	9 052 600	12 062 190
2011	3 076 030	10 270 200	13 346 230
Females			
1960	495 000	869 000	1 364 000
1985	1 336 610	2 681 360	4 017 970
1991	1 682 600	3 560 600	5 243 200
1996	1 845 730	4 423 200	6 268 930
2001	1 971 550	5 382 200	7 353 750
2006	2 090 590	6 453 900	8 544 490
2011	2 166 360	7 609 500	9 775 860
Males and Females			
1960	1 899 000	3 927 000	5 826 000
1985	3 678 000	8 021 800	11 699 800
1991	4 241 470	9 357 300	13 598 770
1996	4 597 080	11 196 400	15 793 480
2001	4 863 800	13 255 000	18 118 800
2006	5 100 180	15 506 500	20 606 680
2011	5 242 390	17 879 700	23 122 090

At 4,4 per cent during 1960-1991 the female LF has been growing at more than twice the rate of males (2,1 per cent per annum), leading to a growth rate of 2,8 per cent for the (M + F) total. The male LF is set to expand by 2,4 per cent per annum during 1991-2011, while the females' participation, growing at 3,1 per cent per annum, will raise the average (M + F) to 2,7 per cent per annum. A net aggregate number of 9 523 000 persons will be seeking new jobs, of which 4 533 000 (48 per cent) will be women. The annual average is a formidable 476 000 men and women.

A study of the age distribution of the female LF increments will reveal that the rising LFP, while it caused some irregular fluctuations – particularly among the 15-24 age category – has not obscured the influence of the differential demographic ageing process so that there is similarity to the male LF. The White female LF shows the attributes of the oldest and the Black LF those of the most youthful population. The former's youthful LF category has trended downwards and the increments will continue to do so (with fluctuations) to end up with a negative number. The

incremental numbers for the prime age category have been increasing - ageing reinforced by rising LFP - but must now be expected to follow a downward path. This is even true of the oldest category concomitant with an overall growth rate that will decline to almost zero during the first decade of the twenty-first century. The Asian women are moving along the phase where the prime and older age categories, after having expanded up to 1991 by way of rising increments, will not experience significant changes in the annual level of increments. For the 15-24 age category the increments have been trending downwards as in the case of White and Coloured women. The latter's prime age category, after expanding by rapidly rising numbers per annum up to 1991, will in future be strengthened by diminishing additions each year, but the oldest category will have increasing numbers added to it. Among Black women only the 15-24 category's increments will be showing some decline. Both the prime and the oldest age groups will receive ever increasing additions to their ranks. And the growth in their numbers of all ages will, at 3,3 per cent per annum by 2006-2011, still be very sizeable compared to 2,0 per cent for Asian women 1,1 per cent for Coloureds and 0,24 per cent for Whites, and will then add 231 280 per annum to the workforce compared to 15 150 by non-Black women; a share of 94 per cent.

3.4 CAUSAL FACTORS INVOLVED

3.4.1 The substitution and income effects

In the analysis of individual labour supply on the part of primary workers - in whose case it is taken for granted that, barring mental or physical incapacity, they will offer their services on the labour market after completing their educational preparation for an occupation - the magnitude dealt with is the number of hours (H) of leisure sacrificed in response to different wage rates. The aggregate labour supply would then be represented by LFP X H (average hours per week, month or year). In the case of secondary workers, LFP decisions are taken in a household context involving a three-dimensional instead of a two-dimensional choice, to wit, wage labour (market production), leisure and homemaking (home production), with the third as a second alternative to the first. Entry into the labour market is not a matter of course, so that it is the levels of LFP that have to be explained given the prevailing hours of work required by employers. These latter can be, and have been, adjusted, to suit the convenience of secondary workers, and thus to elicit the necessary supplies. These adjustments might have been different from those secured by trade unions for primary workers so that the LFPRs of the two categories may not be directly comparable. This difference, however, has an insignificant role in the very conspicuous divergence, in the movements of the LFP over time, of primary and secondary - mostly married female - workers. This divergence occurred in the face of a common experience of similar

upward movements in wage levels and of cross-sectional evidence of inverse relationships between females' LFP and males' wage rates, and between wives' LFP and their husbands' incomes. (Killingsworth & Heckman, 1986, pp 144/5). In the case of the RSA it has been estimated that real wage increases have been responsible for more than half of the growth in female employment between 1950 and 1982 (Council of Economic Advisers, 1987, pp 72-77).

With the response to wage movements being customarily analysed into a substitution and an income effect, the issue is why the former seemed to have been dominant among married females, while the latter appeared to have been more potent among males. The substitution effect would induce increased LFP when wages rise because the alternative to economic effort in the labour market (leisure or home production) has logically become more costly. The increased earnings will, at the same time, have a negative income effect on the labour supplied since more leisure can now be afforded and "bought". Implicit is the assumption that leisure or home production is not in the nature of an inferior good whose income elasticity of demand is negative, and that working time does not fall in the same category as goods comprised in the Giffen paradox whose quantity demanded decreases as price (effort price) decreases.

Within the above analytical framework it is necessary to remember that the magnitude whose rise is to be explained, LFP, is an all or nothing affair, i.e. the transition from non-participation to participation. Accordingly, the income effect which may counteract the substitution effect in the event of rising wages among males cannot materialise without further ado among married females. Working time (in the labour market, that is) which does not exist (zero LFP) cannot be given up in a process of buying more leisure when wages rise. It can only be relinquished when it does exist (positive LFP) but then in toto; but this would be contrary to the common-sense premise that an increase in wages may reduce economic effort but not to the extent of lowering earnings. When wages decline, the income effect, which now requires a sacrifice of leisure in favour of working time, can manifest itself only in the acceptance of LF membership. But since this means that the person must have been outside the LF before, and thus without own-wage earnings to buy leisure, the income effect appears as a *non sequitur* in the life of the secondary worker when she is considered in isolation.

The income effect can be resurrected by assuming that the woman in question, taking her decisions in a household context, has at her disposal some non-labour income (non-own-wage earnings) contributed by some other working member(s) of the family, invariably the head or main breadwinner. Loss of this non-own-wage income by reason of, for example, the husband's unemployment, will have the income effect operating in the usual manner: entry into the labour

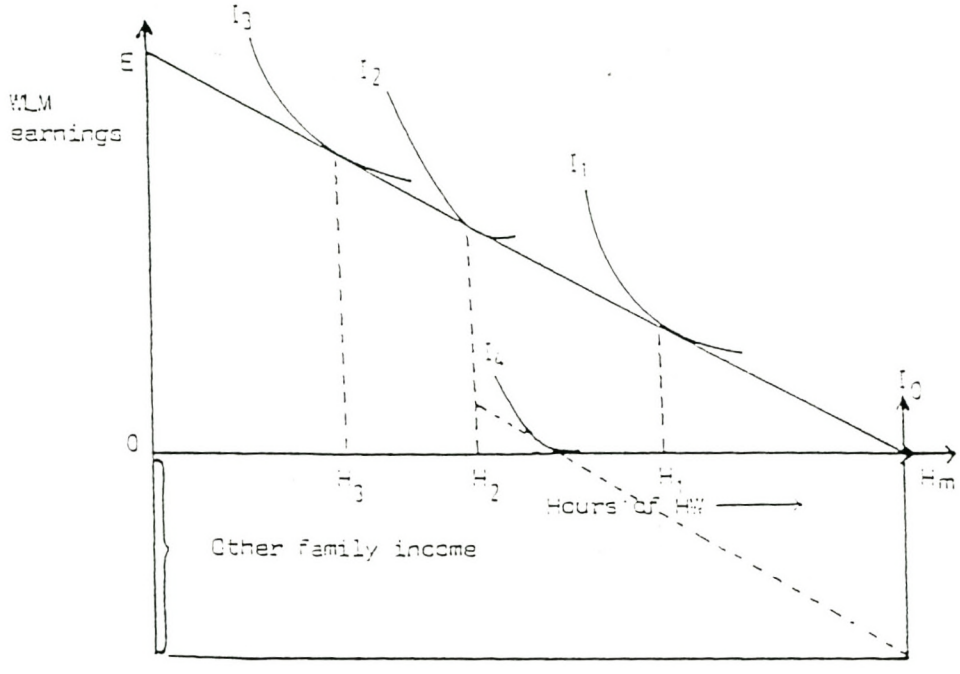
market, referred to as the additional worker effect. In the normal course of events such cross-substitution of economic effort would be of a temporary nature. However, the loss or absence of the non-own-wage is of a long-term nature when the economy stagnates and job creation comes to a standstill. The abrupt increase in female LFP between 1985 and 1991 in South Africa is associated with just such conditions. Either a continuance or a repeated short-term (cyclical) recurrence of the conditions, coupled with a ratchet effect, can stretch the additional worker effect into a long-run phenomenon.

A similar result can be produced by the transitory wage, which is the difference between the permanent wage, W_p (the present value of the expected stream of future incomes) and the actual wage, W_a. An increase in W_a-W_p will prompt a rise in LFP for two reasons: (i) The opportunity cost of time at home will increase, engendering its substitution by labour market time, while the income effect will be inoperative in the presence of an unchanged W_p. The outcome can qualify for the description of opportunity effect. (ii) Over time W_a enters into the denominator as part of the desired level of living to which the family has been accustomed and which is to be maintained, resulting in a diminution of the ratio W_a/W_p which generates an LFP-enhancing effect on the part of secondary worker aggregates when successive generations of them are subject to this influence. Similarly the target worker can be said to arise from a threat to the family's living standards occasioned by events such as financing a child through university, replacing an old motor car or expensive household appliances, etc. Over time this category of workers can increase in relative numbers to augment the level of the aggregate LFP.

3.4.2 Married women as semi-autonomous workers

In the discussion above women's LF performance has been associated with one of the two aspects involved, viz. the supplemental function in the family's income. However, the married woman can be a wage-earner in her own right regardless of family circumstances; but because the latter can impose some constraints on her actions we can designate her as a semi-autonomous worker. Instead of explaining LFP in terms of a transition to LF membership (and back), the exposition can proceed according to the usual continuous trade-off between earnings in the wage-labour market (WLM) and hours of activity in the home as housewife (HW), that is, between the production of wage goods and the production of home goods. The latter consists of the processing of raw materials and semi-finished goods into final goods ready for use by the family and other services pertinent to family life including some which are very specialised, such as giving birth to children and nurturing them.

FIGURE 3.4
DIFFERENTIAL TASTES FOR MARKET WORK AMONG MARRIED WOMEN



Given the family income contributed by a chief breadwinner, there are three proximate determinants of married women's LF performance: (i) The relative strength of the taste for WLM earnings *vis-à-vis* HW duty; (ii) the rate of exchange (R/E) between the two, (the wage rate, or the terms on which the market is prepared to exchange income for leisure sacrificed, not being as appropriate as in the customary earnings-leisure dichotomy). HW has an own value which leisure cannot have; if it is performed in somebody else's home it fetches a price; (iii) the efficiency of home production.

In terms of Figure 3.4, in which the LF behaviour of married women is superimposed on a given amount of other family income, H_m represents the maximum number of hours occupied at home, presumed to be spent in HW activity, that can be exchanged for market production. If, from this position, circumstances permit of a reduction of hours required for HW purposes, leisure time ensues which provides increased latitude to opt for the WLM. The positions and shapes of the indifference or iso-utility curves I_1, I_2 and I_3 in Figure 3.4 describe differences in tastes for work in the WLM. The points of tangency of the R/E line (EH_m) to the iso-utility curves define the equilibrium conditions. The rectangle I_0H_m (a corner solution) expresses an absolute preference for HW, whether voluntary or obliged by circumstances. I_1 permits of H_mH_1 hours of market work at the rate of exchange EH_m, but its steep slope is indicative of a limited substitutability of WLM work for HW duty, signifying that a considerable rise in market earnings is required to elicit the exchange of an extra hour of HW for WLM activity. At the same exchange rate the utility function embodied in I_3 will yield H_mH_3 hours of market work and reflects a keener response to a small rise in earning rate than I_1. The relative positions and slopes of these curves testify to both intercommunity (contemporary) and across-time (within one and the same community) differences. The reasons for them are linked with the emancipation of women as well as a host of other factors.

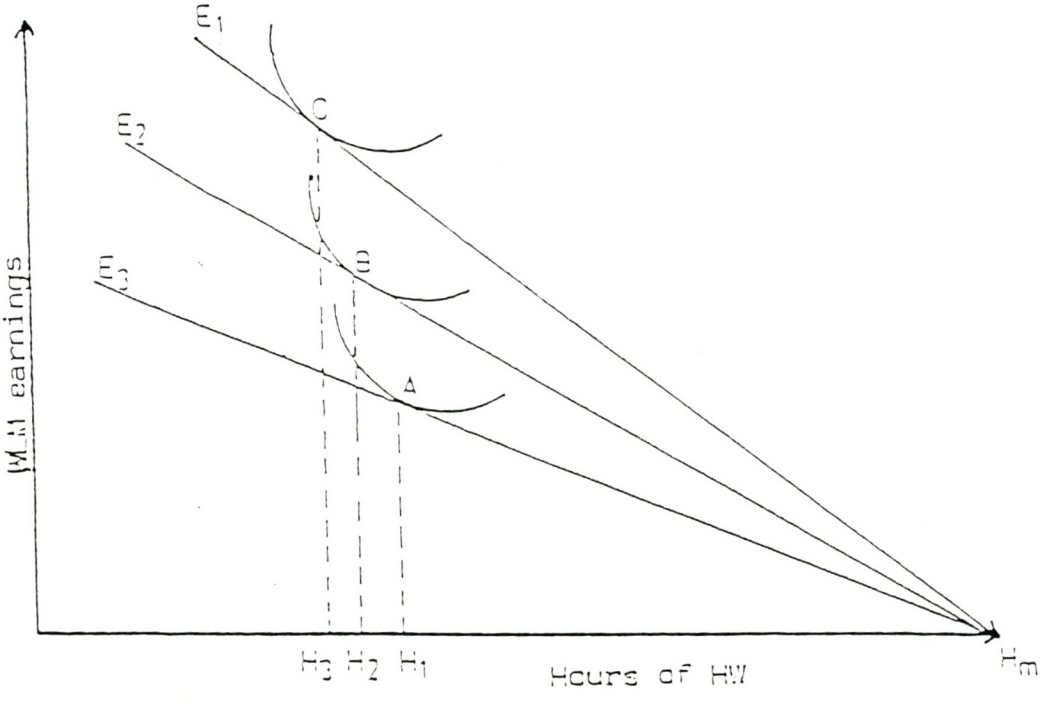
Inhering in the choice between market and home work there is a choice between types of goods produced in the two places of work. The relative strength of the taste for market goods and home-produced goods involved is a function of the family's level of income. Compared to that of the former the income elasticity of the demand for own-home production may be low or even negative inasmuch as it could fall in the category of inferior goods: staple products and services, compared to luxury or prosperity goods included in the former. The income elasticity of demand for domestic servants, outside help that is, may be high, but this attribute does not apply to the housewife handling the chores in her own home (Cain, 1966, p 116). She could preferably increase her earnings in the labour market to afford hired domestic service. It amounts to producing the goods and services in the market which women would have been produced at

home, and then buying them with the income earned in the market. The outcome is rendered more probable by the circumstance that a market job can be a desirable alternative in the company of co-workers who provide a pleasing social ambience, contrasting with possible drudgery or boredom at home, and the anonymity of urban life in the residential area. Market work in this case yields a high rent in the form of the comparative agreeableness of the job.

There is a good deal of avoidable cost involved in the acceptance of market jobs: extra or better clothing, extra visits to the hairdresser, transportation costs, the hiring of substitute domestic services, and the tax that has to be paid on earnings if these are joined to the husbands' as a marginal amount for the purpose of income tax assessment in a progressive tax system. If married women were purely marginal workers acting in a supplementary function, or motivated by pecuniary net benefits only, the above costs would be subject to close scrutiny approximating to a cost-benefit examination. Without evidence for a definitive conclusion it would seem, on balance, that such scrutiny is not the norm. It would, it can be contended, accord a decided role to progressive taxation. The role is not a simple one since it will depend very much on the marginal tax rate applicable to the husband's income in a joint assessment of tax liability. It can be appreciated when this is 40 per cent the wife or couple may decide that it is not worth their while working for 60 per cent or less of the quoted gross wage or salary. If the tax rate is 20 per cent the wife's take home pay rises to 80 per cent of gross wage, which will render it less conspicuous, so that a diminished, or zero, disincentive effect may arise therefrom. This could account for the differentials in the responses, in a HSRC sample survey, from White, Asian and Coloured women who indicated taxation as a moderate to powerful deterrent in their decision to withhold their services from the labour market. In the category of women who opted out of LFP the percentages were 47 per cent, 25 per cent and 23 per cent respectively for the three non-Black groups respectively. In the case of women who would have liked to participate, but did not, the Figures were 49 per cent, 37 per cent and 20 per cent respectively (Van der Walt, 1987, pp 93-95). The conclusion is that taxation is restraining without being preclusive and that its impact does indeed depend on its level (as determined by income bracket). The restraint could have been attenuated by 'economic necessity' and 'desire for a higher living standard' found in the HSRC study to be the second most important factors in the explanation of variance in married women's LFP (pp 60-63, 75-79).

The question now is whether the substitution effect may not be neutralised by the income effect when market productivity, and hence the wage rate, or R/E rises. The answer, on the balance of probabilities is in the negative. As illustrated in Figure 3.5

FIGURE 3.5
MARRIED WOMEN AND INCREASES IN MARKET WAGE RATES



the iso-utility curves, coinciding with iso-production curves since we are simultaneously implying a trade-off between two types of production, move up due north. The slopes of the wage lines E_3, E_2 and E_1 increase to produce greater numbers of HW time given up, from H_mH_1 to H_3H_m, in favour of market production. If the income effect were to operate it would imply "buying" more HW, which is a non-event since it is not more leisure, but more work of a different nature that is to be opted for. And it has already been argued that the own-income elasticity of demand for HW is likely to be negative, the effect of which is buttressed by the relative income elasticities of demand for market production versus home production. The domination of the substitution effect has been confirmed by other researchers (Bowen & Finegan 1965, pp 131-136; Cain, 1966, p 116; Mincer, 1962, p 95).

The obverse to the above rise in the R/E is that which emanates from an increase in the efficiency of home production. In the latter, as in market production, productivity can be raised by putting more capital apparatus, embodying increasing amounts of technology, at the disposal of the housewife which in this instance takes the form of durable goods such as electric polishers, vacuum cleaners, washing machines, refrigerators, freezers, microwave ovens and similar appliances. Their acquisition is tantamount to a substitution of capital for labour, so that a given amount of domestic duties can be performed in fewer hours. The action is reinforced by the increased availability of preserved and frozen goods, pre-cooked meals, manufactured clothing, laundering, dry cleaning, hairdressing and other commercial services, which serve as direct substitutes for the housewife's home produced goods and services and which create opportunities for her to produce in the market at a wage what she has previously produced at home without payment.

The striking changes that have occurred in the life of a housewife in the developed countries and which have a direct bearing on her LF behaviour are succinctly summarised by Lebergott in the following passages: "... the typical married woman in the nineteenth century America made all the children's clothes ... as well as her own; baked the family bread; prepared its soups and preserves (and even the family soap through most of the century), washed clothes for six persons without benefit of anything more than a washboard, dusted, cleaned and performed a variety of other domestic chores ... The dazzling array of material goods now incorporated into the American standard of living proved to be the key incentive for increased female workers' rates in recent decades .... In recent years in the United States the consumer in "consumer durables" has proved to be the working wife" (1964, p 66).

The increase in home production efficiency, given the taste for work - that is, given the locus of

the iso-utility curve which is representative of an iso-production curve as well - can be diagrammed by having the R/E line swinging tangentially along the curvature of the indifference curve from the position of maximum involvement in HW, as indicated by H_m in Figure 3.5. The increasing tangent gradient does not imply that a rise in wage rate is required to call forth more market activity, but only that fewer hours in home production need to be foregone for a given market remuneration. At a minimum the hours of market work will remain constant. At a maximum, the entire entailed increase in leisure time can be exchanged for market production.

3.4.3 Fertility and market production

Human reproduction, being the most exclusive form of home production and therefore the most exclusive alternative to market production has a very marked effect on participation in market production. Home production acquires an infinitely high value during child birth and for some time before and after the event. It means in effect that the opportunity cost of an hour of labour market activity becomes infinitely high, so that the substitution effect in favour of home work reigns supreme, no matter how high the wage rate may be. How long this period is going to last will depend on conditions at the place of work and at home. If the labour contract provides for liberal maternity benefits it will be an incentive to remain in the job until paid maternity leave is to be had, and to return when it is terminated if conditions at home permit. The latter include the availability of partial substitutes for the mother's attention such as household help, crèches and nursery schools. Whether they can act as full substitutes is a matter of individual predisposition about child rearing which can differ from one mother to the next. But given the personal predilection, the demographic determinants of the duration of the period of infinitely high value of home production, and the degree of decline in this value thereafter, are the level of fertility, the birth interval and the age of the children. If the intervals between the births of successive children are very short there is very little likelihood that home work will lose its supremacy until the expiration of the period of fëcundity (in the case of uncontrolled fertility) or of family-building. However, of greater consequence than numbers of children is the age of the youngest. Mothers contend that their absence from home is of little importance as long as they are present when the children were not at school. That is evidently why one author found the presence or absence of children under 6 years among married women in the USA to describe the dividing line between high and low LFPRs (Bowen & Finegan, 1965, p 87). The older the children the lower the relative value of home production. Children in the house older than, say, 16 years can even be a source of assistance which can boost the economic activity rates of married women.

The decline in fertility, coupled with some telescoping of the family formation process, and

combined with the increase in life expectation relieved the housewife of a great deal of household drudgery and conferred upon her many additional years of comparative freedom from the activities involved in the reproductive and childrearing process. This freedom permits of opting for longer attachment to the LF. A comparison of the reproductive behaviour of the 1920-25 and 1945-50 birth cohorts of White women, for example, shows the number of years in question to have been some 8 years.

A negative association between LFP and level of fertility has been established for at least the urban communities of a large number of countries. United Nations' researchers who regressed the findings on fertility in the World Fertility Survey on three types of occupations - the modern, transitional and traditional - concluded as follows: "The relationship between fertility and work in a modern occupation - is generally negative ... The relationship between experience in a transitional or mixed occupation and fertility is also overwhelmingly negative, but this relationship is somewhat weaker. The association between work in a traditional occupation and fertility appears to be negligible in most countries" (1987, p 273). The conclusions appear to be apposite to the South African situation in which the cross-sectional or intergroup data do not reveal a significant relationship between the two magnitudes. A cogent reason could be the differential incidence of extra-marital births - in 1986/7 - 7,4 per cent for Whites, 16,6 per cent for Indians and 55,1 per cent for Coloured women - which obliges some single female parents to support themselves and their families.

However, within each group, over time, we do find a negative association between the TFR and the LFP as indicated by the percentage changes between 1960 and 1991:

	TFR	Years of EA life
	%	%
Whites	-48	+77,4
Asians	-53	+248,0
Coloureds	-58	+22,4
Blacks	-36	+53,7

This does not imply that declining fertility is more than a facilitating force, or a sole or most significant determinant of female LFP. This is ostensibly underscored by our finding above that the LFPRs of the more recent cohorts of married White women do not apparently manifest the intermittence in LFP we would expect to be induced by the intervention of births. And we cannot be certain of the direction of causality. In the economic theory of fertility the LFPR, in the nature of a proxy for the opportunity cost of children, or of woman's time in general, by way of market earnings to be sacrificed in the reproductive process, would feature as the cause. Krishnan would

have it that "based on the available evidence, there is little reason to believe that the relationship between female labour force participation and fertility is unidirectional; rather there exist reciprocal effects of each variable on the other (1991, p 178). Again, taking cognisance of the unobserved variables, or unobservables, which may be in operation, one can concur with Montgomery and Russell when they declare that "marital status, fertility and labour supply are more properly viewed as jointly determined, each being the product of decisions made with respect to a common set of preferences and constraints; the set of constraints, in particular, evolves over the life cycle as essentially irreversible decisions are taken" (1986, p 265).

3.4.4 Other determinants of LFP levels

Whatever demographic and economic forces have been in operation in the determination of women's LFP over time, there are other factors which could have compensated for, or strengthened, or even overridden, their influence . One is the emancipation of women or the breaking down of the domination of an ethic that the woman's (which can include also unmarried women) place is in her home. Since we are dealing with an impersonal market economy, social and familial conventions must permit of her absence from home (in most cases) for part of the day, for her to assume the dual role of housewife and wage or salary earner. "Social values and attitudes" writes the United States National Manpower Council, "exert a pervasive influence upon women's employment. They are reflected in changing conceptions of when and under what circumstances it is appropriate for a women to work outside the home. They underlie judgements about the kind of jobs and conditions of employment which are harmful to women and about the impact of their working upon their maternal function" (1957, pp 14-15). While in general there are now no taboos which inhibit the LFP of married women in industrialised societies, some stereotypes remain about their mental and physical capacities and their being in positions of authority over males, as do distinctions between "men's" and "women's" jobs, partly inspired by fears of wage undercutting on the part of male dominated trade unions, and some reservations and prejudices on the part of employers. In the literature of the sixties it was maintained that cultural bias was an obstacle in Latin American countries (Sadie, 1965, p 7); in Moslem societies, renowned for low levels of female LPP (Indonesia apart) religious attitudes would proscribe work outside the home (Bean, 1968, pp 391-405); that purdah had a similar effect in West Bengal (Myrdal, 1968, p 1085), that in Egypt special significance was to be attributed to an inherited tradition of male domination, coupled with unemployment among men (Nagi, 1971); and in India, among the lower income strata, non-participation was esteemed as a status symbol of social superiority (Sinha, 1965, 5.5).

One can conceive of the waning of LFP-inhibiting traditions, at least in some societies, to the extent where "economic woman" becomes indistinguishable from "economic man". It can be promoted by an ideological commitment in official policy as, for example, in the former USSR and mainland China, where special measures were decreed to remove impediments, to ensure women of equal opportunities with men in all occupations (Dodge, 1966). But the LFP of married women can also provide its own motive power in the form of a multiplier effect in which social resistance is increasingly broken down by the fact of entry into the labour market, once the process has been set in motion.

In a South African sample survey of non-Black women, the HSRC found that the homemaker's role of Asian women, and child care in particular, featured more prominently as a factor inhibiting LFP than among Coloured and White females (Van der Walt, 1987, pp 80-82). Their 1960 LFPR age profile, as in Figure 3.4, largely bears witness to the hold of traditions in earlier times, while the 1991 profile testifies to the waning of their influence in conjunction with other facilitating circumstances. The HSRC finding that the perceptions of the family role of married women were appreciably affected by the LF status of the female respondents, may testify to the dual cause and effect roles of social conventions (pp 41, 43, 54).

The changing perceptions about women's role must have facilitated the satisfaction of married women's desire for self-fulfilment, or 'self-actualisation' which the HSRC survey found to be the prime motivation for entering the wage labour market which permits them to enjoy the company of colleagues in the workplace while performing a satisfying task (Van der Walt, 1987, pp 56-62). This motivation is apparently linked to educational attainment which, apart from being, probably, both cause and effect of women's emancipation, can also have a positive effect on the taste for WLM participation. For some there are the intellectual satisfaction and psychic rewards of professional competence and achievement, while others would wish to put their education and training to profitable use, and the greater the expenditure incurred the stronger would be the incentive to realise some returns on the investment in human capital. The positive correlation between female LFP and level of education, which has been established in a number of studies, seems, however, to emerge only after a certain threshold has been exceeded. (Killingsworth & Heckman, 1986, p 123; Van der Walt 1987, p 27; Sadie, 1965, p 32; Cain, 1966, p 98; Elizaga & Mellon, 1971; Kniesner, 1980, pp 385-389). The more highly educated women are likely to have access to better remunerated and intellectually more satisfying jobs than those less well educated and trained.

The most potent facilitator in increasing female LFP has been the growing number of suitable or

agreeable job opportunities as circumscribed by the nature of women's dual career and/or social perceptions. They will depend upon the degree of development of the economy whose structure can be depicted by the relative significance of the three broad sectors: the primary, secondary and tertiary industries each of which can be subdivided into the traditional and the modern or the informal and formal sectors. In all organised communities we have, in the tertiary sector, government and some professional services which can be neutral with respect to degree of economic development. The suitability in question can be associated with the s factor in our Wps formula for relative attractiveness of a job (see Chapter 4). A value for it of close to 1 (or 100%) will designate, among others, no significant unemployment for women to contend with in an occupation at issue. In this context supply (in the shape of the LFPRs) is determined by demand.

In the traditional pastoral setting, with subsistence farming preponderating, women can combine their economic activities with their domestic (or HW) obligations with facility since they are performed in the same limited geographical area. In the South African Black homelands women and children constitute the actual LF, particularly in the circumstances surrounding the migrant labour system. The transition from subsistence agriculture to commercialised farming and urban industries, makes for a reduction in LF opportunities for women because the away-from-home employment cannot be reconciled with domestic obligations or because priority is accorded to males if there is a scarcity of jobs. Where, as in South Africa, the first stage of development was within the primary sector - from agriculture to mining - the opportunities for women are not enhanced. Where dire need dictated LFP, paid domestic service became the mainstay of female economic activity. When the development of secondary industry brought forth a number of light industries the opportunities for women multiplied in the textile, clothing, tobacco, beverage and food processing industries. For example, the female component of the employed LF in textile manufacturing expanded from 21 per cent in 1967 to 48,5 per cent in 1990, while that of the clothing industry progressed from 70 per cent to 85,2 per cent, compared to a share in the total employed LF of the non-agricultural, non-domestic service sectors of 16 per cent in 1967 and 28 per cent twenty-three years later. In the basic metal industry, which qualifies for the heavy category, the female component in 1990 was only 7,2 per cent.

At first *pari passu* with advancing industrialisation, and later at a faster tempo, the tertiary industries, as an auxiliary to the secondary industries, and as a by-product of rising living standards, an almost inevitable growth of the public sector and the growth of the knowledge industry, provide increasing openings for females as sales workers, clerks, secretaries, typists, telephonists, teachers, nurses, etc. Some of these occupations have become almost the preserves of female workers to the extent of meriting the description of "feminisation" (Paillat, 1963, pp

255-263) as borne out by the following female components of the LF in certain occupations (CSS, 1990):

	%
Correspondence, administrative clerks	64,0
Primary teachers	69,0
Cashiers	81,0
Therapists (occupational, physio)	86,5
Receptionists	93,2
Telephonists	95,8
Typists	97,7

The location of economic activity in the case of the informal sector (backyard, the home itself) permits of an unencumbered combination of home and market work to the housewife and is thus conducive to her participation in the latter. The Central Statistical Service in a 1990 sample survey found a female component of 46 per cent among those participating in the "statistically unrecorded economic activities", which is larger than the 38,5 per cent identified in the 1991 Census (Statistical News Release, PO315, 1991).

At the macro-economic level opportunities for the LFP of women abound when rapid economic growth engenders a tight labour market with employers tapping less than fully exploited sources of supply. Married women are then enticed into the WLM by means of special incentives, particularly in the form of an adaptation of jobs to their specific needs which are associated with their duties as housewives. In an experiment of a large Dutch enterprise these involved a modification of "the geographical, the contractual, the economic, the organisational, the social and the physical components of employment" (De Villebois, 1967, p 609). They include part-time employment, flexitime or convenient shifts, worksharing (two women each doing duty for half the time on the same job), the application of ergonomic principles, crèches at the workplace, special transport arrangements, etc. The length of the working day and the time of day attendance at work is required, are strategic factors. When these can be arranged so that women can be at home when her children before and after school hours require their attention, a significant impediment to LFP will have been removed (Hoem, B & J, 1989, p 62).

3.5 THE SEGMENTED MARKET

Inasmuch as there is a marked difference in the occupational structure and rates of remuneration of men and women, as well as some contrived impediments to women's progress in their LF career, they may be said to operate in a segmented market. While cause and effect are not easily

disentangled, their acceptance of the homemaking or dual role by entering into marriage, involving the risk of having to find employment in the locality where the male breadwinners - in whose education and training as a rule the larger investment has been made - are exercising their occupation, and of interrupting a labour market career occasioned by pregnancy and childrearing, is likely to induce a compatible response in their education and training. It is logical for them to avoid costly investments in human capital that require long periods of amortisation in economic activity, and as preparation for jobs needing many years of uninterrupted experience and continuous practice for proper performance, and rather invest in skills which are subject to the least degree of atrophy occasioned by interruptions and concomitant loss of seniority, and which are transferable between industries, if not occupations. In the result they tend to gravitate towards the feminised occupations in which the opportunity costs of marriage, childbearing and childrearing will be least. In consequence, and because their supply of labour is growing faster than that of men, their services command lower wages, and employers are prepared, or eager, to employ them at these wages. If they receive a net rate of return on their investment in human capital equal to that of men, its absolute level is likely to be lower. They can, to some extent, substitute for young men whose entry into the LF is progressively postponed as a result of longer years of study and are not available any more for jobs filled by them in former times. Their more modern and higher levels of education, youthfulness and relatively low wages can accord them a comparative advantage over male workers older than, say, 50 - 60.

Employers of young women, on their part, are aware of the risk of the interruption of their career by marriage and/or childbearing which will necessitate replacements with attendant induction and, perhaps, training. Employers will consider this a reason for discounting the marginal product of these employees in view of the probable extra costs involved.

It is a common complaint that, over and above wage differentiation consequent upon job segregation, and despite the emancipation of women, there is a good deal of overt and covert sex discrimination in the labour market. Even when old traditions and social conventions inhibitory of female LFP have waned or disappeared, stereotypes about women's personal attributes which qualify them for labour market roles different from those of men, still linger on. These are the perceived or attributed intellectual and physical capability or deficiencies of women, which can be at the root of a taste for discrimination on the part of employers who are predominantly male, and have the power to indulge their prejudices or predilections. The circular process is in action as well: the positions occupied by women have an inferior status because women are the incumbents. Accordingly, female workers may often not be treated on the basis of merit alone, and will have difficulty getting appointed in positions of authority over males. In addition

females are likely to be less well rewarded for their skills than males.

The incidence of sex discrimination in South Africa has been documented by Wentzel (1984) and the Commission of Enquiry into labour legislation (1979). Until 1981 wage discrimination between men and women in public service was officially sanctioned. In 1988 the definition of unfair labour practices was amended to include discrimination on the basis of sex. It is maintained that this did not spell its elimination (Budlender 1992, pp 352-356).

It is contended that even when discrimination in the labour market has been removed pre-market discrimination can continue to place women at a disadvantage in that they are denied the same opportunities as others to develop their capabilities. In this regard it is suggested that the concentration of women in the feminised occupations is a function of moral pressure insidiously brought to bear upon them by society in which males play a dominant role. The larger supplies of the skills thus generated permit of lower wages to be offered. The so-called cumulative discrimination, i.e. discrimination which becomes a function of its own past by way of the depression of labour productivity, can be associated with this pre-market process. The prevalence of a system of internal markets is likely to reinforce it.

In the last resort, given the existence of stereotypes or prejudices which reduce the wage employers are prepared to pay women for their marginal product less the perceived discount, the employment of women has probably been enhanced by their acquiescence. Such beneficial attribute does not attach to the impediments to their upward mobility in the skill or administrative hierarchy of business.

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CHAPTER 4

INTERNATIONAL LABOUR MIGRATION

4.1 MIGRATION AS ADJUSTMENT TO INEQUALITIES

Barring compulsory resettlement or translocation of people and politically motivated refugee movements, persons migrate to seek improvement in their living conditions and specifically, to better their economic opportunities. While decisions about the location of settlement are, for the most part taken in a household or family context, so that considerations other than those of an economic nature will come into play, we shall deal with migration as an economically induced phenomenon (Population Reports 1983, p 11) which revolves around the remuneration of the family's or household's breadwinner(s), whether employee or self-employed. The implication is that utility maximisation requires income-maximisation. It can be argued that even migration for political reasons can be considered to be induced in part by uncertainty about the migrants' economic future in the country of origin.

Arising from perceptions or of acquired knowledge, an individual compares the relative economic attractiveness of a country, region, urban or rural area (denoted by subscript 1) with that of another (subscript 2), which is made up of the following:

W = Wage or rate of remuneration
p = The probability of obtaining a job or a livelihood (ranging from 0,0 to 1,0)
s = The status of the economic activity such as the social or economic status of the occupation, the working conditions, etc. (ranging from 0,0 to 1,0)
C = Cost of movement.

The equilibrium condition would then be defined as $W_1 p_1 s_1 = W_2 p_2 s_2 - C$ and people move from area 1 to area 2 as long as $W_2 p_2 s_2 - C$ exceeds $W_1 p_1 s_1$. Depending on the degree of permanency of migration (e.g. one-year contract migrant labour versus potentially permanent long distance movement across international borders), W can pertain to its point-of-time value or the present value of the long-term earnings profiles in the regions (countries) of origin and destination. The principle is valid for movement both within, and across, the borders of countries.

In the face of the economics of distance, the equality has to be net of the cost of movement, rationality with regard to the latter requiring that the present value of the financial advantages expected to be gained be sufficient to cover it as well. If, thereby, the equilibrium condition loses some verisimilitude in the case of the uneducated and illiterate, distance can be considered a constraint on the movement of people, the impact of which is correlated with its

cost, which, in the case of the temporary or short-term migrant, does not impose present value computations. To give empirical content to the equilibrium condition we can hypothesise that, within a South African context, a subsistence farmer, in a region of rapid population growth unaccompanied by compatible economic growth, can be reasonably certain of producing an income of R120 per month in the agrarian community (p_1 = 1,0), and that he might be able to obtain unskilled employment in the urban area at R1 200 per month. Assuming the status factor to be similar in the two areas, we can have the following outcome (ignoring C):

R120 x 1 x 1 = R1 200 x 0,1 x 1.

Here the adjustment mechanism is the probability of finding employment in the urban area, which in our example is reduced to 0,1 or 10 per cent. This, of course, implies that if the wage differential remains unchanged, the value of p_2 will in its turn determine the flow of migrants, a low value (high unemployment) discouraging it and a high value (low unemployment) encouraging it. This is consistent with the findings of Straubhaar (1986, pp 335-353) who stressed the importance of controls in international migration, which controls were relaxed and tightened depending on the incidence of unemployment in the domestic market. It is also in keeping with the behaviour of some Black inhabitants of South African rural areas who required a work permit to enter the urban areas for longer than 72 hours during the period of influx control and who, when unable to obtain it, moved into towns and cities all the same. The rationale was that if they were discovered without the necessary documentation and had to spend ten months out of twelve in jail, the earnings during the other two months would have been sufficient to render the risk worth their while. While both the push and the pull factors are in operation, the former may become the overwhelmingly dominant one as the marginal product or opportunity cost of labour in the area of origin of migrants approaches zero, which it will be by virtue of unemployment or the reasoning that wife and children can adequately cope with the labour demands of subsistence agriculture. A higher status of jobs in the area of destination than in the area of origin, will further reduce the value of p_2.

One would expect changes in the relative values of W to act as an adjustment mechanism as well. Insofar as the wage differential is a function of the relative scarcity and concomitantly, of the levels of the marginal product, a movement of labour from area 1 to area 2 would reduce the supply in the former and raise it in the latter to enhance W in area 1 and diminish it in area 2. The equilibrating mechanism will be impaired by an inadequate mobility of labour due to inertia or impediments to entry into area 2 such as restrictive immigration laws or influx control measures, whose effect is exacerbated by a higher fertility and growth rate of population in area 1. But the most powerful impairment can emanate from trade union action which severs the nexus between the demographically induced supply of labour and that which is permitted to affect and determine the level of wages. If trade unions extend their influence across regional borders to equalise W of similar industries in areas 1 and 2, with unequal

pressures of population, the burden of adjustment is concentrated on p in any case.

A third potential equilibrating mechanism could assume the form of the movement of factors of production co-operant with labour towards the low wage, low income, labour abundant area. Since natural resources cannot be so translocated, the movement of people to where those resources are located, if inequality of income is to be reduced, is unavoidable. The international emigration during the nineteenth century to the new areas of European settlement (USA, Canada, Australia, New Zealand, South Africa) was in the nature of such adaptation, when Europe experienced its population explosion. The potentially mobile entrepreneurship, capital and technology exhibit a disinclination to be enticed to the sources of surplus labour unless it is more productive and disciplined to engender low efficiency wages in areas of concentrated human habitation representing large markets which reduce the importance of the economics of distance in the marketing of products, and which generate the economies of agglomeration inhering in the presence of supportive production of goods and services required as inputs. And it would seem that senior personnel would even want to find living conditions congenial. Agrarian and small town communities or low density settlements do not satisfy these conditions. In South Africa the market appears to be the predominant location factor for secondary and tertiary industries.

In the theory of international and interregional trade it is argued that the movement of goods and services across borders can be an alternative to the movement of factors of production - labour amongst them - for the equalisation of the remuneration of factor inputs. However, the conditions to be fulfilled for this outcome to eventuate are evidently too exacting for its realisation; for example: perfect competition in trade, identical and homogeneous production functions, unique factor-intensities and no reversals, incomplete specialisation, no transportation costs, and diminishing returns. (See, e.g. Heller, 1968, Ch. 6; Staley, 1970, Ch. 5). But, of course, the most basic condition is that there should be more than a modicum of bilateral or multilateral trade in goods between labour sending and receiving countries. And if entrepreneurship, capital and technology do not move to the former it will have few or no goods to trade, and labour movement will continue to operate as the adjustment mechanism.

There is still the hypothesis that a change in terms of trade may play an equilibrating role. If, as in the Lewis model (1963), the supply of labour from an agrarian community to the industrial area is unlimited, the containment of the real wage in the latter will permit of an accumulation of capital and a growth of its demand for the agricultural produce of the area of origin which turns the terms of trade in the latter's favour. The resultant rise in the marginal product of labour in the area of provenience can remove the cause of the emigration. For this outcome to be realised, however, the rate of emigration has to exceed the rate of population growth, a condition not satisfied with facility. And the exponents of the dependencia model would no doubt refute such outcome.

The actual economic effects of migration on the source and the host countries depend on the demographic and economic characteristics of the people involved, and are thus a matter of empirical evidence which differs according to the type of migration at issue. According to the Population Division of the UN secretariat "there is no consensus on the impact of international migration on aggregate measures of economic performance in the countries of destination" (United Nations, 1997, p 54).

4.2 THE POPULATION OF INDIAN ORIGIN

While the registered immigrants entering South Africa may, in part, be only on an ostensibly permanent basis, some of them emigrating after periods of time, we can deal with them as permanent, to distinguish them from those involved in the temporary migratory labour system. The overwhelmingly large majority of them hail from countries of Western cultural orientation, and are accordingly associated with the White section of the South African population for analytical purposes.

The only significant immigration of non-western peoples into South Africa, which gave rise to the establishment of the community of Indian origin, occurred before 1914. A first contingent of 341 arrived as indentured labourers at a time when the indigenous population apparently had no need of paid work on sugar plantations in Natal. They were followed by increasing numbers, some of them as non-indentured immigrants, to average an annual inflow of some 1 400 between 1890 and 1914. Immigration as a significant force in the growth of the people of Asian origin came to an end in 1913 when legislation was enacted to limit future entry to wives and children of those already domiciled in South Africa, after the government of India had, in 1911, prohibited the further indenturing of labourers, in protest against measures taken by the South African government to curb the immigration of Indians. A law of 1956 ended the practice of South African men marrying women in India and Pakistan as a means of acquiring immigration qualifications for the latter. A voluntary repatriation scheme under the Cape Town agreement prompted an emigration of 47 000 Indians over the period 1911 to 1933, after which there was little net movement. The increase in the size of this population group from 227 600 in 1936 to 986 600 in 1991 has been due to a high rate of natural increase which reached a peak of 3,69 per cent during 1946-51, and declined steadily thereafter but remaining above 2 per cent until the beginning of the eighties.

By now this population, as is to be expected, does not display the characteristics of an immigrant community any longer, the processes of mortality and fertility having excised the remnants of such attributes from the age structure. It can, however, still be enquired whether the immigrants, by way of their descendants, have made a significant contribution to the economy of the country. The only kind of assessment that can be provided in this regard is a

comparison of the skill composition of their labour force (the four skill classes distinguished in Chapter 6) with that of the Coloured and Black populations with whom, it can be argued, they shared the disadvantages of discrimination. This is presented in Table 4.1.

TABLE 4.1

LABOUR FORCE COMPOSITION BY SKILL 1991

CLASS	PERCENTAGE DISTRIBUTION			RELATIVE CONTRIBUTION TO TOTAL SOUTH AFRICAN LF		
	Asians	Coloureds	Blacks	Asians	Coloureds	Blacks
	%	%	%	%	%	%
I Executives	4,6	0,7	0,2	5,1	2,7	4,4
II Highly-skilled	21,6	13,2	5,7	4,9	11,0	31,1
III Semi-skilled	58,1	44,1	30,5	4,6	12,6	58,2
IV Unskilled	15,7	42,0	63,6	0,9	8,9	89,8
	100,0	100,0	100,0	2,9	10,3	68,8

Source: Sadie, 1991, pp 174-5

Both the skill contents of the three groups and their contributions to the South African total numbers in each class bear witness to the superior economic performance of the Indian community. In size their LF represents only 2,9 per cent of the total but contributes 5,1 per cent to the entrepreneurial class and 4,9 per cent to the professional and highly skilled category. The share in the supply of entrepreneurship among the Coloured LF is one-quarter of their contribution to total LF numbers, and one-sixteenth in the case of the Black labour force. Which means that the Indian community has contributed to an improvement in the average economic quality of the South African population. They are known for their industriousness, resourcefulness and initiative, and their scholastic achievements are a good deal better than those of the other two groups included in Table 4.1 (Edusource, 1992, p 5; Bot, 1997).

It would appear that South Africa has been experiencing a low level wave of "new" immigrants - in the sense of non-traditional sources - from Eastern countries since 1988, particularly from the Republic of China (Taiwan) and Israel, and, to lesser extent, from Hong Kong and India (Central Statistical Service, 1988-1997).

4.3 FIRST WORLD IMMIGRANTS

4.3.1 The historic course of immigration

During the regime of the Dutch East India Company, European immigration was more often discouraged than encouraged. Rather, slaves were imported to compensate for a shortage of

indigenous labour, so that by 1793 they numbered 14 747, some 900 more than the Colonists of Dutch, German and French descent (Beyers, 1930, p 249). After the capture of the Cape by the British a government-aided scheme was launched in 1820 to bring 4 000 British settlers to the eastern district of the Cape to develop the agricultural potential of that area and to act as barrier to the interpenetration of Dutch and Xhosa-speaking stockfarmers. As farmers these immigrants failed but achieved economic success when they opted for occupations of their own choice. They were followed by some 15 000 more between 1846 and 1863, while a German contingent of 3 500 arrived during 1857-58 (Robertson 1937, pp 384-401). In the 1891 Census of the Cape it was found that, of the 377 000 White inhabitants counted, some 50 000 had been European-born (Cape Parliament Papers, 1892, par 167). With size of completed families averaging 8,9 among 1853-75 cohorts of married couples, going down but still 6,2 for 1890--95 cohorts, fertility was high and natural increase reigned supreme. The offspring of the immigrants born in the Cape contributed to the predominance of fertility in population growth (Franzsen & Sadie, 1958, p 66).

The £24 million of new capital invested in the gold mining industry during 1895-99, soon after the discovery of gold in the Witwatersrand, was accompanied by a huge influx of immigrants who, according to Cecil John Rhodes, outnumbered the original Transvaal population, and who gave rise to the "Uitlander" problem which led to the 1899-1902 Anglo-Boer War (Robertson, 1958, p 177).

When the war ended the British High Commissioner, Milner, believed that he could neutralise the potential political and cultural influence of the Afrikaner population, as determined by numbers, by means of a massive immigration of British settlers. After a big rush during the first two years the flow slowed down to a trickle, and during the long period of severe depression, over the years 1904 - 1910, emigration probably exceeded immigration. It was not until the end of the Second World War that immigration became once more a significant factor in the South African economy. While the United Kingdom has always occupied, and is still occupying a premier position as country of origin, facilitated by the existence of a large English-speaking community established long ago in this country, making for ease of adaptation, other European countries came to the fore as significant sources of supply after 1946. Among these Portugal (to which Madeira can be added) and Germany are examples, while Zimbabwe became a major source when political troubles erupted in that country.

Tracing the course of net immigration into South Africa (immigrants minus emigrants) since the end of the Second World War, according to periods of ebb and flow, we arrive at the following historic series:

Period	Number of years	Total	Annual average
1947-48	2	49 020	24 510
1949-62	14	52 420	3 740
1963-76	14	423 890	30 280
1977-85	9	139 620	15 510
1986-87	2	-9 940	-4 970
1988-93	6	33 040	5 510
1994-98	5	-21 255	-4 250

Sources: Department of Statistics, 1946-1966, 1968-1980; Central Statistical Service, 1982-1995, P7 and Statistics SA, Statistical Release P0351.

The end of the war saw a rush of immigrants from war-ravaged Europe, actively encouraged by the government of the day. When the new government came into power in 1948 they accused their predecessors of using immigration as a political tool, and reversed the policy to one of discouragement, so that over the fourteen year period 1949-62 net migration amounted to only 3 740 per annum on average compared to the previous 24 510. The new government gradually shifted its position in this regard, and after consulting demographers about the maximum numbers of immigrants that could be allowed without neutralising the numerical preponderance of Afrikaans-speakers, immigration was encouraged and aided financially. Coinciding with a golden era of economic growth of 4,9 per cent per annum over the peak of the Kondratieff -described as La Belle Époque, which was followed by L'Epoque de Malaise (Kahn & Phelps, 1980, pp 9-10; Sadie, 1987, pp 4-8) - the net inflow averaged 30 280 per annum during 1963-1976. The annual volume was almost halved during the subsequent nine years, when the GDP grew at only 2,2 per cent per annum on the downside of the Kondratieff. At a growth rate of 0,8 per cent per annum during the next eight years the economy and immigration have been stagnating with emigration exceeding immigration during 1986-1987 and net immigration registering 5 510 per annum between 1987 and 1993. During the subsequent five years a net loss of 4 250 per annum was recorded and there was, at the same time, a net outward balance of ostensible South African "tourists" of 2 820 per annum (Statistics SA, 1999).

Superimposed on the long trend there are shorter term fluctuations which can be related to political and economic events, as follows. Emigration is triggered, and immigration is discouraged by adverse political events and civil unrest such as the 1960 Sharpeville incident, followed by the South African exit from the Commonwealth, the assassination of Dr Verwoerd in 1966, the eruption of the armed conflict in Rhodesia, 1971, the Soweto riots of 1976, the state of emergency during the eighties, and the high level of political uncertainty thereafter. When memories of unfavourable events of brief duration have faded and economic growth have taken over as the dominant factor, emigration declined and immigration burgeoned. Since the middle of the eighties the concurrence of chronically adverse political and economic circumstances put a damper of lengthy duration on net immigration.

Of special interest is the role of persons with South African citizenship in the flow of emigrants (i.e. only those recorded as emigrants). When we analyse the historical series, and allow for a time lag between the occurrence of a major political event and the migratory reaction, we find that the South African component until recently reached a maximum at the end of an emigration upsurge following upon the event which sparked off such movement. After the Soweto riots of 1976, for example, the component rose from 21 per cent to 41 per cent in 1980. It seemed to have reached an all-time maximum in 1989, at a level of 49,8 per cent, after which it has gone down to 39,7 per cent in 1992, which has the semblance of part of another cycle. Looking at it over periods of high and low relative levels of aggregate emigration the following course can be identified:

High emigration	1977-1980	28,6% of total emigrants
Low emigration	1981-1984	32,8%
Very high emigration	1986-1987	45,8%
High emigration	1989-1992	44,9%

Whatever the emigration cycles have produced, the long trend has been decidedly upward. It is impossible to say, however, whether or not the slight attenuation of this trend represents only a temporary improvement in the confidence in the future of the country on the part of the White population under the new government established by universal suffrage (in which the fastest reproducing group was bound to triumph) following upon the greater uncertainty about this future before the elections. While during this period of efflux of South Africans the economic stagnation might have appeared as a contributing factor, the occupational composition of the emigrants indicated that they were the least likely to have become the victims of unemployment or affirmative action.

In a comprehensive viewing of the migration scene, immigration into South Africa, even while periodically interrupted by political events, can be considered demand-determined for the most part, while emigration appears to be politically motivated to a major extent.

In the above concatenation of events migration is portrayed as an effect. But it is both cause and effect and it is rather as a cause of economic change that it requires our attention.

4.3.2 Attributes of the migrants and their consequence

As is to be expected of economically motivated migration, persons in the EA ages (15-64) and males preponderate, as is revealed by their age distribution and masculinity ratio compared to those of the demographically oldest section of the South African population, the Whites, whose ranks were swollen in the process, as follows:

	1965-70 Net Immigrants Age %	1970 SA Whites %	1986-91 Net Immigrants %	1991 SA Whites %
0-14	23,1	31,0	12,3	22,1
15-64	74,8	62,5	79,8	68,5
65 +	2,1	6,5	7,9	9,4
	100,0	100,0	100,0	100,0
M/F x 100	119,5	99,6	114,3	98,9

Over the years both the migrant and the settled White population have exhibited the effects of declining fertility, particularly as reflected in the 0-14 age group. (The migration figures are on a net basis but there is little difference between the gross and net magnitudes.) The immigrants do not only register some 12 percentage points more persons - in relative terms - in the 15-64 age group, but 69 per cent of them are concentrated at the 20 to 39 age interval compared to 47 per cent for the settled population. Over the period 1960 - 1985, which includes the hey-day years of migration, 1963 - 76, and the 1977-85 years of lower but still sizeable migration, their net contribution to the growth of the White population was 22 600 per annum compared to 46 600 by natural increase, a ratio of 48 to 100. When the children born to them in South Africa during that period are added, it can be asserted that they raised the growth rate of the White population from 1,1 per cent per annum to 1,8 per cent per annum; by 64 per cent, that is. Their contribution is, of course, even more impressive when the comparison is confined to the 1963-76 period.

And all the time they were reducing the dependency ratio, a process which, *ceteris paribus*, would have raised the *per capita* national product.

The role of immigrants emerges even more dramatically when the analysis is confined to the White male labour force during 1963-76, when it expanded by 197 500 by way of natural increase and by 160 900 through immigration, the latter thus adding 45 per cent to the total increase, or in a ratio of 81:100 compared to natural increase. When the latter is discounted for the absorption of manpower by the obligatory military service the ratio increases to 94:100 (Sadie, 1983, p 22).

More significantly still, the immigrants were raising the quality of the labour force as quantitatively measured by their skill composition.

TABLE 4.2

SKILL COMPOSITION OF THE IMMIGRANT AND SOUTH AFRICAN LF FOR SELECTED YEARS

	1965-75 Immigrants	1975 SA LF	1975-85 Immigrants	1985 SA LF	1985-91 Immigrants	1991 SA LF
White Collar	%	%	%	%	%	%
Class I	3,9	2,7	6,1	2,7	17,7	2,6
Class II	26,8	5,0	32,9	6,8	1,7	7,4
Class III	22,9	12,8	26,4	15,0	39,7	15,9
Class IV	0,0	2,6	0,0	4,3	0,0	5,1
	53,6	23,1	65,4	26,2	59,1	31,0
Blue Collar						
Class II	39,7	4,5	28,4	5,0	31,1	5,1
Class III	6,7	22,6	6,2	20,8	9,8	20,2
Class IV	0,0	49,8	0,0	45,5	0,0	43,7
	46,4	76,9	34,6	71,2	40,9	69,0
Total	100,0	100,0	100,0	100,0	100,0	100,0

Sources: See Table 4.1

Comparison of the immigrants and South African LF's (all four groups combined) skill structures leaves no doubt about the superiority of the former. Among them the majority were white collar workers and among these latter, up to 1985, the high level manpower (HLM) - classes I & II - preponderated. Compare, for example, their 1975-85 percentage of 39 per cent for HLM with the SA LF's 9,5 per cent. If for the sake of ease of comparison we combine White (WC) and Blue Collar (BC) workers, and condense the skills into three categories HLM, middle level (MLM) and lower level manpower (LLM) we have the following result for 1975-85 whose net immigrant composition was slightly less distinguished than that of 1965-75:

	Immigrants	**Total SA LF**	**White LF**
	%	%	%
HLM	67,4	14,5	49,9
MLM	32,6	35,8	48,9
LLM	0,0	49,7	1,2
	100,0	100,0	100,0

It is seen that the (net) immigrant LF was not only superior in skill structure compared to the total SA LF, but also to the White LF, the group with the best skill make-up of the four ethnic groups. The immigrants always had relatively fewer of the executive class in their ranks than the settled White population, but the relative strength of their WC and particularly their BC numbers in Class II far exceeded that of the White group. And in Chapter 6 it is being reported that some one-third of the entrepreneurial class members in South Africa are foreign-born. But perhaps the most outstanding contribution of immigration to the SA LF was its share of 51 per cent in the total increase of skilled BC workers during the 1963-76 period.

While the international migration policy of the government was ethno-selective, the economy and the skill content of the LF required skill-selectivity as well. South Africa had need of the scarce factor of production, skilled manpower. It would have been illogical and insensible to encourage the immigration of unskilled labour for which Africa would have been a prodigious source of supply, but which is also the most abundant type of labour engendered locally, as prominently evidenced by the 1991 43,7 per cent complement and the 1975 49,8 per cent complement displayed in Table 4.2.

The data for net immigration during the six years between 1985 to 1991 reflect a deviation from norm, in that the share of WC Class II numbers in the total net number was a negligible 1,7 per cent compared to 32,9 per cent and 26,8 per cent during the two preceding ten year periods. This was the time of maximum emigration of foreign-born and South African citizens alike, most of them members of the professional and technical category, and immigration was barely sufficient to neutralise the outflow. In this regard the results of a survey among medical students of a Cape university are revealing. Two-thirds of them were seriously considering emigration because of "career opportunities in other countries, concern for personal safety, fear of economic hardship in the future South Africa, concern about limited standards of health care, fear of loss of privileges, opposition to the present direction of change in government and the election" (Weiss, 1993, p 4). South Africa was experiencing a brain drain in the form of human capital invested in highly skilled manpower, the cost of which was, for the most part, borne by taxpayers at large. Quantitatively, however, it was until 1993 just about neutralised by immigration, some of it from the rest of Africa which could least afford a brain drain. The self-governing territories and the autonomous TBVC countries were reported to have attracted some 7 000 African doctors, dentists, veterinarians, academics and other professionals from the rest of Africa (Leistner, 1993, pp 219-222).

In the above analysis we have *prima facie* evidence of the beneficial effect of immigration on the SA economy. However, in assessing its employment effects one has to consider the oft repeated indictment on the part the Black LF, that immigrants were substitutes for them and, more recently, the promise by an ANC-dominated government's spokesman that the inflow of European immigrants who were "snapping up jobs at the expense of unemployed Black, Coloured and Indian South Africans" was to be curbed (Morris, 1994, p 5). The argument used to be that rather than importing workers from overseas the local population had to be trained; which cannot be flawed as a principle of long-run policy, particularly in view of the reluctance White trade union members used to display in the acceptance of Black apprentices. But for practical points-of-time purposes it is not valid. The gestation period of a skill is fairly long so that it cannot be produced at will, or not in amounts sufficient to satisfy the needs or demand which may develop at a specific time. A practical example may be instructive. Let us assume standard V is the cut-off point for general, undifferentiated education, and that a population has an adequate pool of human resources with this educational background. To

aspire to, say, the BC skilled category, a member of this pool would need at a minimum to obtain a standard VIII certificate and three years training thereafter, a total of six years after standard V. In the case of professionals this period could be 11 to 15 years, disregarding the subsequent years of practical experience required for proficiency. Unless there is in the educational and training pipeline sizeable numbers of persons ready to be released on to the market with the necessary variety of skills, the market demand is unlikely to be met. Even if the condition is satisfied at the beginning of an unanticipated long period of growth and development, the human resource pool can become exhausted. When HLM is needed at time t, the economy cannot live on a promise that the necessary indigenous supply would be forthcoming at time t + n.

During the era of high immigration a pipeline, referred to above, of adequate dimensions did not exist among the educationally most advanced group, the Whites, while among the Blacks not even a pool of reasonable size of basically educated persons obtained. Intent on solving the Poor White problem - long after it had ceased to exist - the government pursued a policy of according preference to members of the White LF, involving legislated discrimination against others and, particularly, Black workers. Encouragement of skill-selective immigration in these circumstances meant that immigrants could not have been substitutes for, or competitors of, indigenous White workers and, *ipso facto*, not for the rest of the LF either. They were complementary to the existing LF, at least in the case of HLM, supplementing the domestically engendered supply. If it is conceded that the superior performance of the developed communities of the world is a function of the superior quality of their LF, it follows that the enhancement of the quality of the SA LF occasioned by immigration, did not detract from, but added to the welfare of the indigenous LF. Coming as they did from the more developed countries of the world, the immigrants might conceivably have brought with them more productivity-enhancing competence and experience than obtained in the host country. They might also, as Spengler would maintain, have introduced "cultural heterosis" to engender beneficial competitive tension and "new sets of values conducive to economic enterprise" (1956, pp 38-40). As both cause and effect they were involved in the following process: economic growth and development created a demand for immigrants whose influx stimulated the economy to continued or higher levels of growth which, in turn, attracted some more immigrants whose contribution to the economy created opportunities for workers whose employment was dependent upon the existence of the kind of skills embodied in the foreign-born workers.

The dimensions of these opportunities can be approximated by means of (a) multipliers and (b) elasticities of employment in which it is presumed that lower levels of manpower in the skill hierarchy are dependent for their employment upon higher levels of manpower in the formal sector of the economy - from which persons in the teaching profession have been excluded, since many of them are underqualified and therefore not quite class II members,

and because their numbers are demographically - rather than economically - determined. We can then distinguish the following magnitudes:

A (a) The employment multiplier (EM) of the entrepreneurial class (i.e. the average number of workers owing their employment to it); and (b)the elasticity of employment (EE) with respect to it, measured over time, assuming that this class is the determinant of the employment of all others.

B (a) The EM of WC class II; and (b) the relevant EE, assuming it to be the precondition for and determinant of the employment of all others bar class I.

C (a) The EM of BC class II; and (b) the appropriate EE, assuming it to be the prerequisite for the employment of BC classes III and IV.

It is presumed that in the above regard immigrants will not differ from the aggregate employed LF. The results are summarised in Table 4.3.

TABLE 4.3

PROBABLE MULTIPLICATIVE EMPLOYMENT EFFECTS OF IMMIGRATION

	Employment Multiplier		**Employment elasticity**	
	1963-76	**1979-91**	**1963-76**	**1979-91**
A. Class I	30,3	21,0	5,1	3,7
B. WC Class II	6,1	4,5	0,8	0,6
C. BC Class II	8,6	14,2	2,1	3,1

As is to be inferred from the skill composition of the SA LF, an executive class immigrant with an employment multiplier of 30,3 and an elasticity of 5,1 during the hey-day of immigration (and economic growth), could have had a very beneficial effect on the employment situation. During the period of lesser immigration and lower economic growth these magnitudes declined to 21,0 and 3,7 respectively. The comparable values for white and blue collar Class II are a good deal lower but still quite considerable. Even if not in the precise ratios contained in Table 4.3, immigration boosted local employment. Comparison of these ratios with the substantially lower ones in the more developed economies (MDC) forms the basis for the argument that the world's economic welfare is raised by the transfer of HLM from the MDCs to the LDCs. In the former, where there is an ample supply of it, the private marginal product approximates to the social marginal product and the individual is remunerated accordingly. At this rate of remuneration or its approximate level, the individual emigrating to an LDC would probably have a social marginal product much in excess of his private marginal product in the host country. *Ergo*, the world enjoys a more efficient

allocation of resources, with the poorer communities benefiting most.

Interestingly, after 1976 and concomitantly with a large reduction in immigrants' contribution to the BC skilled class, from 51 per cent to 11 per cent, the employment multiplier and elasticity of employment with respect to this category rise above that of 1963-76. This must be viewed against the following rates of increase in employed BC labour by skill, as derived from adjusted manpower surveys by the Department of Labour (later Manpower) and the Central Statistical Service:

	1963-76	**1977-91**
	% p.a.	**% p.a.**
BC Class II	2,9	1,2
III	3,1	2,4
IV	2,6	1,2
Total	2,9	1,4
MFP	1,1	0,3

It would appear that in the absence of supplies of skilled BC labour from foreign sources after 1976, recourse was increasingly had to semi-skilled workers. These latter, however, to judge by the multifactor-productivity (MFP) whose pronounced fluctuations over the years 1977 to 1991 described a 0,35 per cent per annum trend for the manufacturing industry, compared to a more or less sustained increase of 1,1 per cent per annum before 1976, were not, or not efficient, substitutes for skilled workers (NPI, 1997).

In light of the number of co-determinants of economic growth in South Africa, involving the problems of multi-collenearity and the direction of causation, distinguishing econometrically the contribution of immigration to the increase in the GDP becomes problematical. One researcher, employing a constant elasticity of elasticity production function, suggested that, whether skilled or unskilled, the labour introduced by immigration will raise aggregate income of the population by more than the wages paid to them (Chiswick, 1982, pp 289-313). Part of this augmentation can materialise via its contribution to the realisation of the economies of scale. (Greenwood and McDowell, 1986, p 1751). A rough estimate of the contributing of net (non-African) immigration to the South African GDP can be proffered by weighting the various categories of labour with their approximate relative remuneration, assuming that no displacement of indigenous labour had occurred. The relevant weights applied were BC and WC class IV = 1; BC III = 1,5, BC II = 3,0, WC III = 2; WC II = 9, WC I = 17. The results of the exercise suggest that while immigration was responsible for 5,4 per cent of the increment in total population numbers during 1963-76, and for 11,2 per cent of the expansion in the formal sector employed LF, it added 26 per cent to the growth in the Gross Domestic Product. During the years of meagre immigration and high emigration, 1986-91, its share in the employed LF increment was 0,6 per cent and in the GDP growth 1,04 per

cent.

The significance of this considerable premium is enhanced by the fact that the host country does not bear the costs involved in the formation of the human capital embodied in the immigrants. UNCTAD, defining this capital as the present value of expected future earnings of a skilled immigrant aged between 25 and 35, puts a value of 184 000 US dollars (R650 000 at 1994 exchange rates) on it. It can also be computed by approaching it from the opposite side by determining the end value of the series of expenditures involved in the human capital formation from birth to the stage where a person begins his career as a skilled worker. Premising a five year post-school period of education and training (ignoring still the extra years of experience represented by a medium age of 28 years) and a rate of interest of 13 per cent (the return to the national capital stock prevailing during the time of heavy immigration) South Africa would have been made a free gift of R620 000 invested in human capital with the entry of each immigrant in the HLM category. (The amount will, of course, vary with the level of the rate of interest applied.)

Because of its variability, migration would have exerted a stabilising influence on the economy by way of its effect on (i) the rate of unemployment and (ii) the rate of inflation. It is tantamount to an adequately stocked pipeline of experienced manpower whose outflow could be regulated, at least to some extent, in accordance with the conditions in the host's labour market, opening it wider when the domestic supply becomes inadequate to meet the demands of the economy and tightening it when immigrants may become competitors of domestic workers in a situation of job scarcity. Pressure on wages is relieved during periods of intensive demand for labour, while the rate of unemployment is contained when demand slackens.

By the beginning of the nineteen-sixties, after two decades on the upward phase of the Kondratieff, the domestic HLM pipeline had become drained of reserves to serve the needs of the thriving economy, whose absorptive capacity was high. Both the demand for, and supply of HLM had become inelastic. Any upward shifts in the demand would have meant sizeable increases in the wage rates if they had not been compensated by comparable shifts in the supply in the absence of immigration. Cost inflation would have been added to demand inflation. As it was, price inflation did start to accelerate at the beginning of the seventies, but was restricted to single digit figures until 1974.

As to the wider implications of immigration there is the possibility that foreign capital might have been attracted. This would have been true in those cases where the HLM entering the country was the result of direct investment by foreign companies. When the series of long-term private capital inflows into South Africa is lagged by two years, a degree of correlation does emerge, but the link appears too tenuous to permit of a positive inference about

causation. For the rest, the consumption of the immigrants and their housing needs would have stimulated economic growth by way of the income and matrix multipliers. The stimulus emanating from the provision of their housing, which, like other demographic investments tends to be capital-intensive, appears to have been very substantial when considered in the framework of the private construction market in which the upper and middle income group - Whites for the most part - predominated. During 1963-76 immigration of 30 280 per annum introduced, on average, 10 100 new households into the economy per annum - an augmentation of 51 per cent of the demand which emanated from natural increase among the higher income groups. Because of their manpower status one would expect them to have raised the propensity to save of the aggregate population. This, however, could not be statistically verified.

4.4 AFRICAN IMMIGRANTS

4.4.1 Documented immigration

For statistical data on African immigrants legally present in South Africa we are dependent upon census enumerations of foreign-born Blacks in South Africa. They revealed the following numbers:

	Male	Female	Total
1936	259 600	71 500	331 100
1946	433 700	102 100	535 800
1951	482 600	120 600	603 200
1960	483 800	102 000	585 800
1970	459 700	56 400	516 100
1980	303 000	39 900	342 900
1985	273 300	44 800	318 100
1991	314 200	108 000	422 200
1996			427 800

Source: CSS, Population Censuses, 1936-1996.

Most of these figures represent under-enumerations which varied from census to census, the degree of which most likely exceeded that of the South African born population, the illegal immigrants among them having had more reason to conceal their presence than the latter. Their sex composition and the changes in numbers over time until 1985, however, do reflect the nature of this migration. It consists for the most part of temporary workers whose turnover is approximately 100 per cent per annum, and whose numbers are closely linked to the employment of foreign workers on the South African gold and coal mines. The steep rise in the female component after 1985 represented an inflow of illegal immigrants from war-ravaged neighbouring countries. It is generally conceded that there are many more of them than have been included in the 1991 census.

With 80 per cent and more of the African migrants working in the mining industry - the large majority in gold mines - their fortunes and performance can be identified with those of this industry. At the time of discovery of gold on the Witwatersrand the industry experienced great difficulty attracting local labour at the level of wages offered. During the first twenty years the industry depended almost entirely on Mozambican workers whose recruitment was regulated by various agreements with the Portuguese authorities then in control. At one stage recourse was even had to indentured Chinese labour in the search for adequate supplies. "In time Natives from the Union and the High Commission territories (now called Botswana, Lesotho and Swaziland) were persuaded to enter the mining field ... once their prejudices against working underground had been overcome ..." (Gemmill, 1961, p 3).The Mozambicans remained the largest component of the foreign labour force until 1975, when 144 400 of them were engaged in South African mining (representing a quarter of the total mine LF). After the collapse of the colonial power and commencement of civil war in Mozambique, followed eleven years later by a South African ban on recruitment in that country, the numbers employed by members of the Chamber of Mines dwindled to 43 100. Lesotho took over as the premier source of foreign migrant labour, its share going up from 36,7 per cent in 1975 to 50,7 per cent in 1986 when total employment in the mining industry was at its peak, and to 56,3 per cent in 1991 when the total had diminished by 146 250 or 27 per cent, and that of Lesotho workers by 19 270 or 17 per cent. Before Malawi imposed a ban on recruitment, following the death of migrants in an air crash on their way home in 1974, (rescinded in 1977) there were some 109 800 Malawians employed in the South African gold and coal mines and another 27 900 in non-mining industries (Chamber of Mines, 1982, p 97 & Leistner, 1988, p 18). By 1991 they had all but disappeared as registered members of the mining LF. As revealed by Table 4.4, which in this case include workers engaged in non-mining industries as well, Botswana, Swaziland, Zambia, Zimbabwe and Namibia have also been, and still are, sources of labour supply.

TABLE 4.4

FOREIGN BLACK WORKERS EMPLOYED IN SOUTH AFRICA

	1975	**1980**	**1986**	**1991**	**1992**
Mozambique	150 700	60 500	73 200	64 500	65 300
Lesotho	152 200	136 400	138 200	118 900	114 000
Malawi	39 300	31 800	31 400	13 600	13 600
Botswana	37 000	29 500	28 200	23 600	21 800
Swaziland	16 400	12 000	21 900	23 000	22 600
Zimbabwe	8 900	20 500	7 300	7 300	7 300
Zambia	900	900	2 400	2 400	2 400
Angola	600	300	20		
Namibia and others	8 500	3 100	75 400	79 400	79 400
	414 600	**295 000**	**378 100**	**332 700**	**326 400**

Source: Leistner, 1988, p 123; Chamber of Mines, 1991, 1992.

The foreign component of the gold mine LF expanded steadily from 52 per cent at the beginning of the second world war to 79 per cent during the early seventies, after which there was a drastic reduction to 46 per cent in 1979, followed by a decade during which the percentage share oscillated around 42 per cent (Matlosa, 1992, p 35, Chamber of Mines Annual Reports). The expansion phase coincided with the rapid development of secondary industry in South Africa which offered higher wages and preferred working conditions to South Africans. The contraction phase set in when manufacturing industry was no longer the source of a briskly increasing demand for labour. The rate of increase in its volume of employment declined to 2,2 per cent per annum during 1975-82, down from 4 per cent per annum during 1950-75, and showed a negative trend after 1982 while fluctuating (SA Reserve Bank, 1994(b)).

Judging by the skill content of the foreign workers - unskilled and semi-skilled - and the rapid growth of the SA LF of similar status, one would have expected the former to have been substitutes for the latter. But, by all accounts, that they were not, at least until the middle of the seventies. To South African Blacks, the remuneration has evidently been insufficient to compensate them for the marginal disutility of effort in an occupation which held little attraction for them. In practice a segmented market obtained. When the demand for labour in the secondary sector began to flag, which allowed less scope for the exercise of job preferences, while the higher gold price permitted of increased wages, and strained political relations between South Africa and its neighbours spurred greater reliance on domestic supplies of labour, the foreign migrants emerged increasingly as substitutes. In other words they represented a stabilising influence in the South African economy: during the expansion phase noted above they acted as complements which did not induce, or add to, unemployment, while inhibiting increases in wages, and in the contraction phase the reduction in their numbers made for less unemployment among the local LF.

There cannot be any doubt that the foreign migrants were a major force in getting the gold mining industry off the ground and keeping it alive, and in so doing contributed largely to the growth of the South African economy. The industry has been, and is, constrained by two forces beyond its control: (i) the quality of its natural resource, the gold content of the available ore, that is; (ii) the international price of gold, except when relieved by declines in the external value of the monetary unit. The industry cannot pass on cost increases, the latter having to be countervailed by raising the grade of ore mined, which reduces the life of mines and the total amount of the metal which can be extracted and exported to earn foreign exchange. Its role as earner of the means of payment for indispensable imports is disclosed in Table 4.5, as inferred from data provided by the Reserve Bank (March, 1999 and previous issues).

TABLE 4.5
GOLD, THE GNP AND THE BALANCE OF PAYMENTS

	The Import content of the GNP	Gold's share in Exports
	%	%
1946-1958	30	32
1959-1975	31	32
1981-1993	26	30
1994-1998	30	17

The Balance of Payments, given a zero or balanced capital account, has always been, and will remain, the ceiling against which the very open economy is forever pushing whenever it shows a reasonable degree of vigour. (An analysis of historic data for the years before the great stagnation (1981-1993), which specified current account equilibrium as condition, puts this ceiling at 2,2 per cent in terms of GDP growth). Even with an anaemic economic growth of 0,6 per cent per annum (GNP or GDP) during 1981-1993, the average propensity to import (goods and factor and non-factor services) was still 26 per cent after having been 32 per cent and 39 per cent during periods of rapid growth. In individual years of rapid growth the marginal import ratio has been 60 per cent and more. Consisting predominantly of capital goods and intermediate inputs the imports are a necessary condition for growth, with a relatively high income elasticity and low price elasticity. In this context it can be maintained that the social marginal product of R1 earned in foreign exchange exceeds that of R1 of goods sold in the local market.

Therefore, any industry that can raise or support the ceiling conduces to economic growth. Manufacturing industry, as a net consumer of foreign exchange, does not seem to be capable of doing this; its growth tends to lower it. The mining industry, together with agriculture, as net earners of foreign exchange, has been fulfilling this role. Gold, with a share upward of 30 per cent in South African exports has, accordingly, been a mainstay of economic growth. A figure of 32 per cent was recorded during the period of maximum foreign worker participation, 1959-1975. By 1998 it had dropped to 13,5 per cent.

It has been estimated that in real terms the average cash wage of Black mineworkers remained almost constant for six decades, 1911-1969 (Wilson, 1972, p 46). This could only have been achieved by importing labour from neighbouring countries. Dependence upon local supplies of labour only would have required increases in wages which might, not inconceivably, have met with a backward sloping supply of labour, to raise the wage component of exploitation cost. In 1961 the general manager of the Native Recruiting Corporation and the Witwatersrand Native Labour Association attested that "gold mining on the Witwatersrand has been built up on the basis of migrant Native labour ... If the mines had been unable to secure unskilled Native Labourers to perform manual labour, the cost of production would

have risen to such a degree that only the richest sections of the gold-bearing conglomerates would have been capable of being worked at a profit. Because such labour is available, however, the industry, from 1886 to 1959, has produced 619 474 000 million ounces of gold worth £4 592 millions. ... The early mining ventures had the greatest difficulty in finding sufficient local inhabitants to operate these workings" (Gemmill, p 2).

During the ninety years since the discovery of gold in which foreign migrants were the major LF component, they were instrumental (through their contributions to the national product and foreign exchange earnings) in providing the indigenous Black LF opportunities for progressively more highly remunerated jobs in the non-mining sectors. The preponderance might also have rendered the legal restrictions on the upward mobility of Black workers less onerous by virtue of the fact that their burden rested more heavily on foreigners than local workers.

There is a health hazard for South Africa involved in the foreign labour migration in that some of the workers may be carriers of a malaria parasite, plasmodium faleiparum, which shows signs of resistance to countermeasures (Marais, 1994, p 11). The World Health Organisation, again, estimated the HIV sero-prevalence in some of the countries of origin - Mozambique, Zambia, Zimbabwe, and Malawi - to be above one per cent in the adult population which can contribute to the spread of AIDS in South Africa (United Nations, 1994, p 1). However, this is, in the main, a threat posed by the movement of illegals across South Africa's eastern and northern borders, rather than by the efficiently administered migrant labour system. The medical facilities of the Chamber of Mines are adequately coping with the health problems involved.

The obverse of the benefits, recounted above, bestowed upon the SA economy by foreign migrant labour, is the economic benefits to the sending countries. To illustrate these we have to depend on quantitative data which cannot be considered `hard' or comprehensive but are not, therefore, devoid of significance. In Table 4.5 are assembled (i) estimates of foreign gold and local mineworkers' earnings in 1991, based on the Chamber of Mines (Annual Report, 1991, p 58) report that unskilled and semi-skilled labour was receiving R946 on average per month in cash and R323 in kind (an addition of 34 per cent in the form of food, accommodation, medical aid, sporting and recreational facilities); (ii) a balance of payments transfer to neighbouring countries of R2 211 million in 1993 as remuneration of foreign workers, who, in this case, include those engaged in the secondary and tertiary sector as well. (Personal communication by the SA Reserve Bank.) Since this figure accounts for 97 per cent of the amount recorded by the SA Reserve Bank as "net remuneration paid to non-resident employees" the latter is assumed to be adequately indicative of the earnings of workers from neighbouring countries. The amount reached a peak of R2 804 million in 1990 before slumping to R1 569 million in 1998 (South African Reserve Bank, 1999, pp S-127).

The 1993 amount was allocated to countries according to the relative numbers employed in mining as the predominant employer, as in Table 4.5.

TABLE 4.5

	Earnings of foreign Black Mineworkers 1991 (R million)			Probable transfers to countries of origin (all foreign workers) 1993 (R million)
	Cash	**In kind**	**Total**	
Lesotho	1 059	362	1 421	1 189
Swaziland	181	62	243	203
Botswana	152	52	204	171
Mozambique	489	167	656	389
Other	-	-	-	259
			2 524	**2 211**

Not all of the earnings can be transferred to the countries of origin. The payment in kind is, by its nature, consumed at or near the work place, but at the same time this reduces the necessity of extensive purchases for the purposes of everyday life. The governments of the sending countries understandingly prefer that a maximum be transferred: Mozambique and Lesotho required that 60 per cent of earnings be repatriated in the form of deferred pay, Lesotho reducing its requirement to 30 per cent in 1991. Also, during the course of the year of employment some remittance of earnings by the individual to his household does occur, and at the end of the contract period a portion of income is usually repatriated by way of gifts and other goods. The Chamber of Mines would have it that "about 60 per cent of the total income earned by these mineworkers finds its way back into economically depressed regions"(1991). At the same time not all of these remittances are lost to the South African economy which benefits a second time round by way of payment for imports from South Africa by the countries of origin.

In Table 4.5 the balance of payments transfers exceed the cash wages (except for Mozambique) because in 1993 wages were higher than in 1991. The 1993 amounts include the remuneration of migrants working outside the mining sector, and the numbers of migrants involved changed between 1991 and 1993. The juxtaposition of the two sets of statistics together with the *National Income Statistics* published by the United Nations permits of a reasonable judgement of the economic importance of the migrant labour system to the sending countries. That migrant labour is the lifeline of the Lesotho nation is attested by the following figures relating to its contribution:

% of foreign exchange earnings			Addition to GDP		
1980	1985	1990	1980	1985	1990
%	%	%	%	%	%
59	66	57	72	92	69

Sources: Whiteside, 1986; United Nations, 1991.

It is the major foreign exchange earner, and in 1990, when its share in the generation of the GNP was 42 per cent (47% in 1985) it raised the GDP by 69 per cent (92% in 1985). It was estimated that in 1981 for every 100 Basutho men employed in Lesotho in wage-paid jobs 375 were engaged in the migrating labour system across its border. (Whiteside, 1986, p 58; Penny, 1986). This kind of quantitative relationship might have held or risen until 1987, since when South Africa has been playing host to diminishing numbers of Basutho migrants. The numbers of illegal entrants are unknown.

It is a moot question whether some part of the payment in kind and of cash wages spent inside South Africa should not be credited to the GNP of the sending countries. If the migrants did not leave their countries they would have had to be fed, clothed and otherwise cared for in any case, even if not at the same standards as at their place of work. In the event the migrants' earnings will feature even more prominently in their home country's economy.

The contribution of migrants' remittances to the economy of Mozambique is presented with lesser confidence since that country's national accounts do not reveal enough, and it is difficult to know what level of exchange rate would correctly reflect the true value of its monetary unit. The remittance seem to have added some 19 per cent to the GDP of Mozambique in 1991 and to have been responsible for around 46 per cent of its foreign exchange earnings on current account. At the peak of Mozambicans' employment in South Africa, before the end of colonial rule, the resultant addition might well have been more than twice as high as in 1991.

By 1991 Malawi's migrant workers in South Africa have been making an almost negligible contribution to that country's GNP. But before the 1974 ban on recruitment it would have been quite substantial since there were 100 of them for each 310 employed in the formal sector inside Malawi. (Extrapolated in reverse from Economist Intelligence Unit, 1986, p 28.) Concomitantly, the remittances would have been the major foreign exchange earner.

The remittances of migrants from Botswana and Swaziland add about 4 per cent and 3,6 per cent to the GDP of the two countries respectively. The contributions in the case of Zambia and Zimbabwe are smaller still. Of course, for specific rural areas where the migrants hail from, the income generated by migrant labour is not negligible.

While the export of labour has been presented above as a blessing to the countries of origin, relieving their labour forces of large members which their economies cannot accommodate and making handsome contributions to their national products, the economic dependence implied is seen as a cost. An editorial in a Lesotho newspaper phrased it as follows: "This economic dependence on South Africa gravely undermines Lesotho's international stature as a sovereign state. The country's socio-economic stability is largely contingent upon external factors" (Translated by Matlosa, 1992, p 36). Having in mind the consequences of a large scale retrenchment of foreign workers in South Africa, the Southern African Labour Commission, founded in 1980, was given the task of trying to effect a gradual withdrawal of the member states from the migrant labour system. In this the Commission, in the absence of the necessary employment creation within the members' economies, was not successful. The reduction in the number of foreign migrants operating in South Africa, which did take place, was the result of the Chamber of Mines' policy of reducing dependence on foreign sources of labour supply, and creating a LF of career mineworkers by re-engaging repeatedly as many workers as are prepared to co-operate.

4.4.2 A new category of African immigrants

The political status of the former self-governing states and TBVC countries accorded their governments the opportunity of making appointments of their own choice which had particular significance for the high level manpower category. In many cases they opted for Black professionals from other African countries and elsewhere in preference to persons from the Common Area (the rest of South Africa) who, in terms of required levels of competence, would probably have been Whites. The political situation in South Africa after 1990, and particularly after the new government came into power in 1994, provided fresh impetus to this non-traditional type of African immigration. The United Nations secretariat reported that "the end of apartheid triggered a demand for qualified Black managers, technical workers, academics and other highly skilled workers, and there were not enough educated, experienced South African Blacks to meet the demand ... South Africa is replacing Europe and North America as the preferred destination for skilled African labour" (United Nations, 1998, p 154). The relevant numbers are unknown, but one surmises that many hundreds, rather than many thousands, are involved.

Even if their employment evinces the character of a substitutional process, in that they are preferred because of their ethnic origin, as a sort of adjunct to affirmative action, they constitute a supplementation to the category of highly skilled labour to relieve pressure resulting from its relative scarcity in the labour market. Given that they are adequately qualified and competent (on a par, that is, with their competitors) the outcome for the economy is positive only.

4.4.3 Undocumented immigration

Undocumented or illegal immigrants are aliens whose presence in South Africa, having entered or remained in the country in contravention of the Aliens Control Act 96 of 1991, is not validated by the required documents. By their very nature, estimates of the numbers involved cannot claim validity at, say, the 90 per cent confidence level; and a variety of them are being bandied about, ranging from 2 to 8 million (Haldenwang, 1996, p 71). The only reliable statistics relevant to illegal immigration pertain to the expulsion, or involuntary repatriation, of aliens as furnished by the Ministry of Home Affairs. The numbers of repatriated increased from 51 550 in 1989 to 96 600 in 1993, and rose at almost the same tempo during the following four years to reach 176 350 in 1997 (Mickleburgh, 1997, p 2; Reuters, 1998, p 8). More than 99 per cent of the individuals in question had arrived from neighbouring countries, the bulk of them (84 per cent) from Mozambique. It is not known to what extent stricter law enforcement contributed to the rising number of repatriations but they also bear testimony to a swelling throng of people prepared to brave the immigration laws of South Africa, or enter the country in ignorance of such laws.

A reasoned estimate of the dimensions of illegal immigration can be based on fragmentary data relating to persons who entered South Africa from other African countries and departed for these same countries (Central Statistical Service, 1992-1999, P0351). It emerges that during the intercensal period 1991-1996 approximately 1 800 000 Africans did not return to their countries of origin. To judge by census data on foreign-born Blacks, some 500 000 of them could have qualified for temporary or permanent residence; most of them workers on mines and farms and their families. This leaves 1 300 000 as the (probable minimum) number of undocumented immigrants. They are, of course, most unlikely to allow themselves to be included in a population census as foreigners.

"The consequences of undocumented migration are still unclear". This is the verdict of the Population Division of the UN Secretariat after examining the literature on the topic (United Nations, 1998, p 210). The economic effects will depend on whether migrants arrive as economically active individuals, or accompanied by dependants, whether they are employed, self-employed or unemployed, and on the nature of their occupations. If unemployed they function as consumers only, as do their dependants. If they are employed in occupations avoided by indigenous workers either because of their nature or because of low levels of marginal productivity of labour, they make a net contribution to the GDP of the host country. The survival of their employers' enterprises may depend of the availability of such labour. The outcome is the same if they are employed because they are valuable and docile and therefore prepared to work for lower than trade union-determined wages; but then they could operate as substitutes for resident workers to cause increased unemployment among the latter. The substitutional effect will, of course, only be obtained if the employment would in fact

have eventuated at trade union wage levels; but trade unions themselves are averse to contemplating the contrary probability, and regard illegal immigrants as cause of depressed wages as well. COSATU has complained that farmers' access to such labour impeded the formation of trade unions among farm workers and permitted the survival of employers on marginal land that could otherwise be confiscated for redistribution to poor Black people (Minnaar *et.al.*, 1995, p 34).

The Minister of Home Affairs reported to parliament in May 1998 that 195 employers (out of 110 450 investigated) had been found guilty of harbouring illegal aliens (Reuters, 1998, p 8). The foreign workers employed by farmers in Mpumalanga and the Northern Province outside immigration legislation – and on whose behalf 11 000 exemptions have been issued during 1994-97 (Republic of South Africa, 1997, p 23) – would also constitute illegal or para-legal immigration. Whether or not exploitation in marginal labour productivity terms is involved here, the jobs to the workers concerned represent a desirable alternative to jobless poverty in their areas of origin.

Illegal immigrants who are self-employed in the Distribution sector, for the most part as street vendors, in direct competition with indigenous traders, and adding to the phenomenon of overtrading, in all probability only induce a redistribution of a given amount of purchasing power, reducing the income of their South African counterparts. When the latter's resentment turns to wrath, violence ensues. When these hawkers do generate net new demand by bringing with them self-made artefacts, often – so it is alleged – without paying custom duties, the effect is the same as that of imports on the Balance of Payments. The African Chamber of Hawkers and Informal Business has claimed that 2 000 of the 15 000 hawkers in central Johannesburg were illegal aliens (Minnaar *et.al.*, 1995, p 33); and in July 1994 some 300 of its members marched to the police headquarters of that city to demand a review of immigration laws and the immediate repatriation of these immigrants (SA Institute of Race Relations, 1995, p 19).

Illegal immigration constitutes a drain, even if of unknown proportions, on fiscal resources, depriving residents of a full measure of social and economic services provided by the state. Obviously, those of them convicted of criminal offences are being jailed at the expense of taxpayers. In 1994, for example, 12 400 were arrested for committing rape, murder and other serious crimes (Solomon, 1996, p 9); and it has been averred that the incidence of violence, gunrunning, drug trafficking, car theft, armed robbery and crime syndicates in South Africa is correlated with the rising tide of illegal immigration (Financial Mail, 1994, p 22). Such events add to the crime-infested environment in which the economy does not operate at its optimum and which acts as a deterrent to foreign investment.

The deportation of 156 600 aliens in 1995 cost the country R12 million. Those of them who

managed to acquire false passports and identity documents are entitled to assistance under the RDP (Redistribution and Development Programme). The Central Economic Advisory Service has suggested that the provision of housing, education, police services and medical care to the majority group among the illegals (the Mozambicans) would have required an amount of R270 million in 1995 (Financial Mail, 1994, p 22). At a minimum they cannot be denied emergency medical treatment, and the task team appointed by the Department of Home Affairs maintained that "nor their children [should] be punished for the misdeeds of their parents by denying them access to temporary schooling" (Republic of South Africa, 1997, par. 3.2.4). Moreover, while they can be denied housing subsidies – which will only lead to expanding squatter camps – they cannot be prevented from putting extra strain on the supply of water, sanitation, transportation and recreational facilities. Their meagre contribution to indirect tax revenue cannot compensate for the extra economic burden imposed.

It has been suggested that since South Africa has an interest in stemming the tide within the countries of origin, it should assist in the economic development of the latter. That South Africa could make a meaningful contribution in this regard – barring the discovery of rich mineral resources in neighbouring countries – is a forlorn hope. The supply of enterprise and capital in South Africa has already been insufficient to prevent its own private economy from shedding more than half a million of its employees during 1989 to 1996 (National Productivity Institute, 1997, p 9).

The implementation of the 1995 Draft Protocol on the Free Movement of Persons in the SADC (Southern African Development Community) would have legislated illegality of migration out of existence, having had as its objective the progressive elimination (within 10 years) of all restrictions on the movement of people between SADC member countries and on their economic activity in the country of their choice. The less idealistic 1997 Protocol, overturning the 1995 Protocol, aimed at a much more modest facilitation of movement of SADC citizens and even required members to co-operate in preventing illegal migration (Solomon, 1997, pp 1-4). While South Africa has no need of being a star attraction under a 1995 Protocol system of migration, it does need a type of temporary immigrant who is not adequately recognised and provided for in legislation, viz. highly skilled workers from the global skills market to get specific projects off the ground. The Home Affairs task team quoted above reported that "South Africa has no uniform or standardised policy or mechanism for short term project-tied import of groups of workers with particular skills" (Republic of South Africa, 1997, par. 2.3.8). Foreign investors have complained that South African officials betrayed uncertainty about the handling of this category of migrants and have, in consequence, been responsible for delays in the establishment of projects. Such problems entail delays in, or, at worst, the inhibition of, the generation of national income.

4.5 CONCLUSION

Briefly, it can be concluded that the "old" (pre-1990, and primarily regulated or guided) immigration contributed handsomely to the economic development of South Africa, by providing human resources which were required but not available locally. Such beneficial outcome cannot be claimed for the "new" immigration.

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CHAPTER 5
INTERNAL MIGRATION

5.1 URBANISATION

Four patterns of internal migration can be distinguished: rural-rural, urban-rural, urban-urban and rural-urban. But, economically speaking, it is the movement from rural to urban areas and from smaller towns (sometimes referred to as rural towns) to bigger ones and, particularly, metropolitan areas, that excites interest and requires attention.

Urbanisation is a function of the interplay between population growth and economic growth and development, the economic processes having been characterised historically by three phases as delineated by the industrial structure of the economy. (To emphasise the more recent development of information technology a quaternary phase could be added). The data in Table 5.1 give some quantitative content to the process.

TABLE 5.1
PERCENTAGE CONTRIBUTIONS TO THE SOUTH AFRICAN GDP BY THREE ECONOMIC SECTORS (AT 1990 PRICES)

	1945	1955	1960	1965	1970	1975	1980	1981	1985	1993	1997	1998
A. Primary Sector												
Agriculture	7,5	8,0	7,2	5,4	4,8	4,8	5,1	5,1	4,7	5,0	5,6	5,5
Mining	21,1	20,1	22,5	22,0	18,8	12,3	11,7	11,0	11,4	10,1	8,6	8,6
	28,6	28,1	29,7	27,4	23,6	17,1	16,8	16,1	16,1	15,1	14,2	14,1
B. Secondary Sector												
	17,8	24,2	24,3	28,6	31,5	35,0	36,5	37,1	33,4	31,7	32,7	32,3
C. Tertiary Sector												
	53,6	47,7	46,0	44,0	44,9	47,9	46,7	46,8	50,5	53,2	53,1	53,6
	100	100	100	100	100	100	100	100	100	100	100	100

Source: S A Reserve Bank 1994, N/A B-8 to B-11; 1999, S-108.

Before the discovery of goldbearing ore on the Witwatersrand in 1886, and even more so before the discovery of diamonds, the South African economy was predominantly agricultural in nature, with a sizeable contribution by the tertiary sector in the form of traditional services - government and domestic - not directly supportive of the main generator of income. In time, still in the primary phase, the mining industry took over from agriculture as the predominating economic activity, and established the nuclei of new urban settlements to add to those which came into existence as a result of other economic bases such as harbours, railway operations,

administrative centres, service centres for agrarian communities, etc. It also set in motion, as a consequence of its backward linkage, the second phase of economic development in South Africa , that of the economic leadership of the secondary sector (manufacturing, construction, electricity, gas and water) with manufacturing, as the main component, itself waning in relative importance after the middle of the sixties. Favoured by a most hospitable national and international environment, the contribution of the secondary sector to the GDP (at factor prices) surged upward after the second world war, to book a maximum in 1981 and reducing the share of the tertiary sector until the beginning of the seventies. Since then the South African economy - at least as represented by the formal sector - is ostensibly moving in the third phase in which the tertiary sector preponderates, even if only by default on the part of manufacturing which has been manifesting relative stagnation since 1981. Even while government still features prominently in this sector, the services in the third phase are, for the most part and unlike those in the first phase, requisite to production in modern industry.

A growing population requires for its livelihood - to maintain it or to prevent impoverishment or to raise the level - a growing economy. The latter entails a movement away from the primary sector to the secondary and the tertiary sectors which are spatially concentrated. Following in their wake the population becomes increasingly urbanised with natural increase within urban areas assuming ever-growing importance as immigrants settle down.

Both the push and the pull forces are in operation. On the supply side the capability of the primary sector to accommodate an expanding population is limited. With natural resources as its dominating factor of production, this sector is constrained by their supply: the non-renewable mineral resources of given amount and quality, and a limited cultivable land area subject to given climatic conditions. The limits are indeed being pushed outwards by means of technological progress, in the case of agriculture by way of bio-technology, and advanced cultivation technology, but it is not an operation that can compensate indefinitely for the constraint imposed by the natural resource. And some of this technology act as substitute for labour inputs which reduces the opportunities for the accommodation of an expanding labour force, while a continual redistribution of land among increasing numbers of households eventually reduces the returns to below subsistence level. In the case of urban industries land is an unimportant factor of production which does not act as restraint on their development.

On the demand side the limitations to the capability of agriculture to generate growth and development are revealed by the low income elasticities of demand for its products. The following values were derived from household budget studies of the four ethnic groups in the metropolitan areas of South Africa undertaken by the Bureau of Market Research (1990 Report No 175, p 20). The incomes per capita of the four groups were used as weights to aggregate the four separate values into single indices, as follows:

The income elasticity of the demand for food	0,53
for fruit	0,93
for clothing	0,99
for furniture and household equipment	1,30
for recreation, entertainment, sport	1,32

While the difference in the levels of the elasticities for food and fruit suggests that the limitations can be tempered by changing the product mix, they are not removed. Moreover, the elasticities of staple foods are a diminishing function of income per capita. The figure for food indicates that an increase of 10 per cent in income will benefit agriculture (and food processing) by 5,3 per cent only. And because of its spatial requirements, as well as its demand for intermediate inputs and capital equipment, a very substantial part of the income generated by farming "leaks" away to urban areas.

The latter have the advantage of being the location of secondary and tertiary industries with relatively high elasticities of demand for their goods and services as exemplified by the above values of 0,99 for clothing, 1,30 for furniture, and 1,32 for recreation. Any increase in income will redound to their benefit more than proportionately. To this is added the matrix multiplier effect of the proximity of interlinked business enterprises providing intermediate inputs to one another as revealed by the technical co-efficients computed in input-output analysis. The leakages, consisting of imports from other regions and countries, are much smaller than in the case of the primary sector; and they are likely to be smaller the larger the area of concentrated economic activity and, in consequence, the size of the internal market; the market potential, that is, from the prospective businessman's point of view.

Market potential, in the experience of the United States and Western Europe, "has a lot of power to explain the location industry ... " (Krugman, 1995, p 45). This is true of South Africa as well. This potential can, for operational purposes, be interpreted as the gross expenditure contra of the gross geographic income plus the expenditure on intermediate inputs (encompassing, thus, both the vector and the matrix in the Input-Output system, but

omitting across-border transactions). Accordingly, the geographic concentration (GC) or polarisation, of non-agricultural economic activity —and, concomitantly urbanisation – can be regarded as a function of the levels of household consumption (C), + government consumption (G), + investment expenditure (I) + expenditure on intermediate inputs/outputs (IO). But these four magnitudes are, (for a specific area) again, in turn, a function of GC. (The factor G could, of course, also be regarded, in part, as autonomous; as an impulse or catalyst, that is, which provides the foundation for concentrated economic activity as would, for example, a harbour or the site of mineral deposits). The process of mutual influencing signifies the existence of circular, cumulative causation or self-reinforcing polarisation.

Population enters the equation as the number (N) by which the per capita disposable income less savings (Ypc in brief) has to be multiplied to arrive at C (=NYpc). In this instance the spatial distribution of population has the character of a determinant of the location of industry.

With regard to investment expenditure the central-place theory tendered as explanation of the location of industry tells us that the trade-off between internal economies of scale and transportation costs induces a clustering of producers. This gives rise to localised external (agglomeration) economies which act as a centripetal force. These economies include the facilitation of specialisation in production; the support of a large local market to suppliers, in the intermediate neighbourhood of their clients, of intermediate inputs produced on an efficiency-conducive scale (associated with the IO-factor); and urbanisation economies in the shape of sophisticated infrastructures, large numbers of buyers and sellers, a diversity of labour skills and educational and training facilities, to all of which the G factor will be positively related.

The concatenation of forces is ably portrayed by Krugman: "Because of transportation costs, the best locations are those with good access to markets (backward linkage) and suppliers (forward linkage). But access to markets and suppliers will be precisely those points at which producers have concentrated, and hence drawn mobile factors of production to their vicinity" (1995, p 90-91).

With labour as the mobile factor of production, the spatial distribution of population features as a determinate of the location of economic activity. Urbanisation proceeds apace as population numbers are being attracted to the loci of such activity.

However, contemporaneously, in the process of circular causation, population becomes a determinant of such location as immigration and natural increase expand the market potential at any given, or rising, level of income per capita.

The culture of cities has an important role to play in the process described above. Urbanism as effectuated in the hustle and bustle of daily life, mass media, interpersonal contact, the clash of minds, competitive lifestyles, innovative actions, and the challenging of conventional wisdom, is a way of life conducive to change and development. Lewis Mumford, the author of *The Culture of Cities* has this to say: "It is in the city, the city as theatre, that man's more purposive activities are formulated and worked out, through conflicting and co-operating personalities, events, groups, into more significant culminations" (1938, p 480). Friedman, expounding "a general theory of polarised development", concurs: "The cumulative effect of successive innovations is to transform the established structure of society by attracting creative or innovative personalities into the enclaves of accelerated change; by encouraging the formation of new values, attributes and behaviour traits consistent with the innovation; by fomenting a social environment favourable to innovative activity ..." (1972, p 82). The environment in the deep rural areas is not thus auspicious.

As a consequence of the economic process depicted above, people move out of agriculture, away from the land, to centres of economic opportunity. This is the pull factor in operation. Even in the absence of any geographical fertility differentials the inability of agriculture to provide increasing population numbers with a livelihood will force the increments to seek accommodation elsewhere, which invariably will be urban areas, whether or not these latter can oblige. This is the push factor. But, in addition, fertility is higher in rural areas and so is population growth - after allowing for differential mortality favouring urban areas; exacerbating population pressure in rural areas. The fertility of rural Whites used to exceed that of urban Whites (Sadie, 1954). Sample surveys of the fertility of Black women found the following values for the Total Fertility Rates for the period 1985 - 1990 (Du Plessis, *et al.*, 1991):

Metropoles	4,09
Other Urban	4,28
Rural Areas	4,98
TBVC	5,33

Ceteris paribus, population pressure conduces to emigration from the rural areas.

TABLE 5.2

PERCENTAGE OF POPULATION IN URBAN AREAS*

	1936	1946	1951	1960	1970	1991
Whites	65,2	72,5	78,4	83,6	86,8	91,0
Asians	66,3	70,3	77,5	83,2	86,7	96,2
Coloureds	53,9	58,1	64,7	68,3	74,1	83,2
Blacks	17,3	21,6	27,2	31,8	33,0	35,7

* The figures for 1980 and 1985 were omitted because of the statistical problems arising from the deviating definition of urban areas applied in the population censuses of those two years. In other years they comprised (i) all cities and towns with some form of local management and (ii) areas of an urban nature but without some form of local management.

Sources: Central Statistical Service, Population Census Publications, Cilliers & Groenewald, 1982, p 44: Sadie, 1991, pp 1-13.

The data in Table 5.2 would indicate that the White and the Asian group have almost completed the urbanisation process, the urban percentages being close to 100 per cent. At 83,2 per cent in 1991 the Coloured population is not far behind, their 1991 rural component equalling in size that of 1970. The great urbanward trek of the Whites was sparked by the Great Depression of 1930-33 which coincided with the Great Drought, after which the absolute numbers of rural inhabitants tended downwards to stand at 451 000 in 1991, down from 714 000 in 1931 and 702 000 in 1936. The Asian rural community numbers only 38 000 after having been 87 000 in 1970 (sources as in Table 5.2). By contrast, the Black population is still very much a predominantly rural society, the urban component representing 35,7 per cent only, and some of them - the migrant labourers - still only temporary inhabitants, though it would seem that the percentage could conceivably be raised by redefining urban to include peri- and semi-urban areas in the erstwhile SGT and TBVC states, referred to as Homelands until 1994, which would not qualify under the Census definition. (Graaff, 1987, p 53). This is in large part a function of history in that by 1936, when the other three groups already had more than half of their numbers residing in towns and cities, only one-sixth of Blacks were thus accommodated. Actually the latter's rate of urbanisation (defined here as the rate of acceleration of the urban percentage) was the highest of the four ethnic groups, namely 1,3 per cent per annum compared to the next highest of 0,8 per cent for the Coloured population and the lowest of 0,6 per cent per annum for Whites.

It is very probable, however, that the urban Black percentage would have been higher had it not been for a policy of control over their geographic mobility until 1985. The Land Act of 1913 denied them ownership of rural land outside the areas reserved for their exclusive and

inalienable occupation (called Homelands for ease of reference) – the Cape Province excepted until 1936 - without prior approval by the then governor-general, while the Native (Urban Areas) Amendment Act of 1937 extended the prohibition to urban areas, and established the principle of influx control. Since 1937 5 434 000 hectares of land have been added to the reserved areas - Black Homelands - as a grant from taxpayers at a cost of R1 220 million. It was however, article 10(1) of the 1945 Native (Urban Areas) Consolidation Act which ushered in the era of the strict application of influx control. A Black person was prohibited from remaining in a prescribed (urban) area for longer than 72 hours without a permit issued by a labour official unless he (i) had been living in that area uninterruptedly since birth; or (ii) had worked uninterruptedly for one employer in that area for at least ten years; or (iii) had been living without interruption in that area for fifteen years or longer without having incurred a fine of more than R500 or imprisonment of more than six months, or (iv) was a son or daughter under the age of 18, of a person qualifying in terms of section 10. In 1952 the obligation to carry reference books (passes) was extended to Black women. In that year it was made virtually impossible for Black squatter farmers on land owned by Whites to leave the farms without the latter's consent. In 1968 controls were tightened to remove the right of wives and dependants of those qualifying according to section 10 to move legally into the prescribed areas (Cilliers & Groenewald, 1982, p 30). The 1967 law on Physical Planning and Utilisation of Resources, and the 1975 Law on Environmental Planning decreed an embargo on the use of land for industrial development without prior approval of the Minister concerned. Provision was made for differentiating between White-labour intensive industries which would continue to be located in the common area, and non-locality bound enterprises which should locate in decentralised areas, that is, away from the common area towns and cities. For the first type of industries a maximum Black:White ratio of 2,5 to 1 was stipulated which, in time, had to be reduced to 2 to 1. The Western Cape was decreed a "Coloured preference area" which meant that Blacks were not to be engaged there unless it could be certified that Coloured persons were not available to fill vacancies. To affirm those restrictions on the entry into (prescribed) urban areas it was decided in 1967 to freeze township development outside the Homelands. The number of businesses that could be owned by individual Black businessmen in the prescribed areas was curtailed as well.

The removal of so-called "Black spots" involved the translocation of some 2 028 000 persons without however changing their urban status (except for a negligibly small number). It is not known whether the 643 000 persons endorsed out of prescribed areas found their way to towns or rural areas in the Homelands or back to the former in due time. (Cilliers &

Groenewald, 1982, p 29).

As is to be expected, employers – in addition to prospective Black employees – found these restraints very irksome, and officials responsible for the implementation of the policy had to act with circumspection to minimise possible harm to economic development. The large majority of requests for additional Black workers were granted by way of permits for their employment on a migratory basis. (Personal communication by the government official in charge at the time.)

The policy was politically inspired. The White government, very conscious of the majority status and the much higher growth rate of the Black population - considered a nation apart - feared the political consequences of the economic integration of ever increasing numbers of Blacks, by way of permanent settlement, in the common area, that is, outside the Homelands. It was accepted that permanent Black residents would eventually qualify for universal suffrage on a common roll with non-Blacks which would mean the loss of political power by Whites in a majoritarian system of government (Tomlinson Report, 1955, Chapter 25). Such loss of self-determination was considered inconceivable at the time. In so far as an economic rationale for the policy was sought, recourse was had to expositions of the diseconomies of industrial concentration in ever expanding cities and metropolises.

5.2 DECENTRALISATION

The counterpart to the policy of minimisation of permanent Black settlement in towns and cities in the common area, was a policy of maximisation of settlement in the Homelands (subsequently known as the SGTs and the TBVC countries). To this end a programme of decentralisation of industries was put into action at the beginning of the 1960s as a means of providing the necessary economic bases. This was planned to occur in "border areas" which were identified by the Council for the Development of Natural Resources and defined as places in which industrial development could take place "through European initiative and control, but which are so situated that the Bantu workers can maintain their residences and family lives in the Bantu Area (Homelands) and move readily to their places of employment" (Palmer, 1980, p 36). The second part of the Tomlinson Commission's recommendation, viz. that the "European initiative" referred to above - and the mainspring of economic development - had to be put to use inside the borders of the Homelands, was rejected. When, later on, this recommendation was grudgingly acted upon industrialists were required to

operate on an "agency" basis.

After the Good Hope conference of 1981 at which the co-operation of the private sector was sought, a more ambitious programme was launched in which 8 development regions were demarcated, for each of which a Regional Development Advisory Council was established whose activities were co-ordinated by a National RDAC. Eleven deconcentration points - areas within the economic sphere of influence of metropolises - and 49 industrial development points were identified. Incentives to lure industrialists away from existing industrial centres and towards these proposed growth points, purported compensation for short-term financing problems during initial years, and for long term cost disadvantages attaching to these decentralised areas, such as railway rebates, rental and interest, subsidies, substitution of tax concessions by cash payments as percentage of total wage bill, housing and electricity subsidies. Incentives favoured labour-intensive industries (which offered opportunities for abuse). The Development Bank of Southern Africa was established (1983) to furnish financial and technical aid, training, and identification, evaluation and financing of projects in less developed regions, while a Small Business Development Corporation had to cater specifically for small enterprises.

The political support for the maximisation of Homeland settlement - and representing a form of affirmative action - was provided by granting the right to self-determination to the ten regions in which 52 per cent of the total Black population was exclusively domiciled, and giving them the option of raising their political status from that of self-governing to that of political independence if they so wished. Four of them - Transkei, Bophuthatswana, Venda and Ciskei - exercised the latter option. Within these regions (states) the people could escape the disabilities imposed upon them in the Common Area (the rest of South Africa). The power vested in them allowed for the appointment of persons of their own choice - also those in the Common Area prepared to move – to all ranks in their civil service, which became a major growth industry with employment opportunities they would have lacked in the common area in competition with the better qualified non-Blacks. And they were not constrained by the inability of their economies to generate the required revenue, generous grants from taxpayers in the common area having provided the necessary funds. At the time of their re-affiliation with the rest of South Africa (after the April 1994 elections), there were 528 000 persons employed in their public sectors. (Inferred from data provided by the Central Statistical Service, Statistical Release P0251; and Delport, 1994, p 13). It was disclosed that in some instances there were more officers than privates, more upper than lower rankers. By 1997 the

fiscus was paying R3570 million per annum to retrenched civil servants who could not be accommodated in the unified public service of the New South Africa (Sapa, 1998, p 1). Township development, to accommodate these people and commuters had been undertaken on an extensive scale (Smit & Booysen, 1981, p 26).

The above negative and positive policy measures affected urbanisation in two ways: (i) They slowed down the overall rate of urbanisation until influx control was lifted in 1985. After adjustment for the under-enumeration and the deviant definition applied in the 1980 and 1985 censuses, we find that the Black population's proportions in all urban areas amounted to 31,8 percent in 1960, 33,0 per cent in 1970, 33,1 per cent in 1980, 32,9 per cent in 1985 and 35,7 per cent in 1991. In 1985 the President's Council, noting a positive correlation, among the countries of the world, between levels of income and urbanisation, suggested that within this context South Africa was "under-urbanised" in 1980 to the extent of twelve per cent. (On the other hand, when, during the 1960's, Latin American cities were receiving large numbers of new immigrants they could not accommodate economically, as has been the case in South African urban areas after the termination of influx control, the situation was characterised as "over-urbanisation"; (ii) the urbanisation within the Homelands proceeded apace, the percentage of their populations residing in urban areas rising from 0,7 per cent in 1960 to 14,9 per cent in 1991, as indicated in Table 5.4. Their economic bases, for the most part, were provided by the public sector and the commuter system. When the restrictive policy was abolished in 1986 there were still some 506 600 commuters participating in the system, while the numbers exceeded 600 000 in some preceding years (Leistner, 1988, p 127).

The combination of the policies of decentralisation and regional development, large-scale financial aid and town development produced very substantial changes in the economies of the Homelands, as quantified in Table 5.3.

TABLE 5.3

HOMELANDS' GDP AND ITS COMPONENTS

Annual Average Growth:

	1970-75 %	1975-80 %	1980-85 %	1985-89 %
TBVC	8,5	6,2	7,6	10,7
SGTs	9,9	6,0	5,9	

Percentage of GDP

	1970 %	1975 %	1980 %	1985 %	1989 %
Non-market production					
TBVC	26,9	28,9	18,1	12,9	8,9
SGTs	33,3	31,5		17,3	10,9
Agriculture					
TBVC	18,8	25,9	12,4	10,0	7,1
SGTs	22,8	24,8		15,4	8,9
Community Services					
TBVC	21,3	24,2	23,2	30,8	30,3
SGTs	27,8	35,2		38,3	49,3

Sources: DBSA 1989, CSS 1976, 1978, 1979, 1992.

The GDP of the Homelands increased at a very much higher rate than that of South Africa as a whole (and, ipso facto, than that of the rest of the country). During 1970-75 the former's rate was just more than twice that of the latter. Over the years 1985-89, when the aggregate South African GDP growth rate (at constant 1990 factor prices) was 2 per cent per annum, that of the SGTs was 5,9 per cent and that of the TBVC 10,7 per cent, the latter in large part due to the extraordinary expansion of the Bophuthatswana economy. In the result the contribution of the Homelands to the gross geographical product of South Africa rose from 2,4 per cent in 1970 to 6,4 per cent in 1988, to lift the per capita product of these regions from R253 to R497 (Ligthelm, 1993, p 60), while the 1988 South African aggregate figure (at 1985 prices) was practically at the same level as in 1970 (SA Reserve Bank, 1994). Since 1975 the subsistence sector (non-market production) has been dwindling in relative size to register a 10 per cent share in the Homelands' GDP of 1989, compared to 30 per cent in 1975. This trend coincides with the decline of the importance of agriculture and, obversely, the burgeoning of urban economic activity.

The large and growing share of Community and Social Services attests to the role of the public sector in the Homelands financed by the taxpayers from across the borders. The

Central Statistical Service reported that in 1976 44,2 per cent of the GDP generated in the SGTs originated in the public sector, in which year the total government expenditure in these areas registered an amount equal to 98,5 per cent of that GDP (CSS 1979, p viii). The expenditure on education, amongst others, spurted from R502 000 in 1985 to R1 520 000 in 1989 (CSS 1992, p 6).

Despite the rapid growth inside the Homelands the major portion of their national income was still generated by economic activity outside the borders. For 1976 the CSS provided the following data for the SGTs: (1979, p viii).

GDP of the SGTs	460,5 million	= 25,0 per cent
Income of commuters	632,6	= 34,3
Income of migrants	751,2	= 40,7
Net national income	1 844,3 million	= 100,0

For the year 1980 it was estimated that the contribution of GDP to gross national income was as follows for a number of Homeland states: Transkei 43%, Bophuthatswana 41%, Gazankulu 33%, Lebowa 30% and Kwazulu 21% (Zingel, 1985, p 4). Judging by the difference in the rates of growth of the Homelands and the Common Area, the GDP of the former would have gained in the provision of the sustenance of their population since 1980 or 1976 but might still have been no more than 38 per cent (compared to 25 per cent in 1976) of their national income by 1989.

The above economic developments are reflected in the changes in the spatial distribution of the South African (aggregate) population, as presented in Table 5.4.

TABLE 5.4

SPATIAL DISTRIBUTION OF THE SA POPULATION

		Homelands	Common Area	Total
Total Population	1960	5 237 000	12 245 000	17 482 000
	1991	18 312 000[1)]	19 426 000[1)]	37 738 000
Growth 1960-1991		4,1% p.a.	1,5% p.a.	2,5% p.a.
Urban population	1960	38 000	7 885 000	7 923 000
	1991	2 576 000	15 822 000	18 398 000
As % of total[2)]	1960	0,7%.	64,4%	45,3%
	1991	14,9%	77.2%	48,8%
Population of largest towns and cities as % of urban population		1960		64,1%
		1991		69,0%

1) Temporary migrants were included in the Homelands' population by domicile (i.e. on a de jure basis) and excluded from that of the common area.

2) These percentages were based on the de facto populations of the two regions (almost all of the migrants in the common area were working in the urban areas).

Sources: Bureau of Statistics, 1968; Sadie, 1977, 1991.

As is to be expected from the above recounting of events the (Black) population of the Homelands grew, at 4,1 per cent per annum between 1960 and 1991, much faster than that of the common area (1,5 per cent per annum) so that, on a domicilium or de jure basis, their share in the residential accommodation of total numbers increased from 30 per cent in 1960 to 48,5 per cent in 1991. The major augmentation occurred during 1960 - 1970 when the Homeland ranks were swollen by a net immigration of 1 310 000 to raise the percentage of Blacks (only) domiciled there to 52,6 per cent after a period of net out-migration which reduced the share from 57,6 per cent in 1911 to 44,8 per cent in 1960 (Sadie, 1977, pp 37/38). The aggregate urban population of the common area expanded faster than its total population, to reduce its rural component by 756 000 between 1960 and 1991. In this the natural increase in urban areas was the major growth force, in a ratio, compared to immigration, of 7 to 1. While the rate of urbanisation in the Homelands was very high, its 1960 base in absolute numbers was very small, in regions then inhabited almost exclusively by agrarian/pastoral communities. Accordingly, its contribution to the expansion of the urban component of the total South African population helped to raise the percentage by no more than 3,5 percentage points, from 45,3 per cent to 48,8 per cent.

Within the urban category there has been some polarisation as shown by the percentages working and/or living in the largest towns and cities with 100 000 or more inhabitants in

either 1960 or 1991, which rose from 64,1 per cent to 69,0 per cent. This trend, coupled with the movement of people from smaller to larger towns, led to what has been described as the "small town in decline". Van der Merwe found that between 1970 and 1980, 36,5 per cent (or 97) of towns with fewer than 2 000 inhabitants had experienced an absolute decline in their numbers, while 16,9 per cent (29) with populations in the 2 000 - 5 000 category had a similar experience. When the analysis is confined to Whites the percentage for the under 2 000 category was 41,5 per cent (or 176) (1982, p 16). Most of these towns are service centres or market towns for the surrounding agrarian communities. They suffer the diseconomies of (small) scale in a cumulatively downward progression: numbers of children too small to justify a secondary or high school, and later on even a primary school, too few parishioners to support a minister of religion, diminishing job opportunities, increasing numbers of empty houses and declining purchasing power which compels the closing of businesses and reduces the status of the towns as service centres, obliging the communities to travel greater distances for some of their purchases. In the history of towns, just as nothing succeeds like success, so nothing fails like failure.

As indicated above, the spatial distribution of the Black population group has, in part, been engineered by means of both coercion and incentives. Focusing on the latter component of the policy, the question arises whether economic resources would have been more productively applied to have led to enhanced economic growth and, particularly, employment, if industries were allowed to be located, with their personnel and without restrictions, in existing urban concentrations.

According to the data published in the Annual Reports of the Decentralisation Board, overseeing the Regional Industrial Development Programme (RIDP) at the time (as quoted in Pretorius, et.al., 1986, p 247 and Tomlinson and Addleson, 1986, p 384) the number of manufacturing jobs created during 1960-1981 in the decentralised areas amounted to 169 000. The estimates for 1982 onwards, however, differ according to whether or not the figures of the Board, based on applications for participation in the programme, are discounted for applications that had evidently not been succeeded by actual investment. If discounted, the total employment opportunities generated during 1982/3 – 1986/7 stood at 147 000, whereas the applications indicated 190 000 more (Dickman, 1991, p 136; Panel of Experts, 1989, p 84).

These figures do not necessarily represent the net contribution of the RIDP and its predecessor to job creation, since some or all of it might have been no more than a substitutional shift of location of industrial activity. It has been contended that a counterbalancing 100 000 jobs could have been lost as a result of the restrictions imposed by the Physical Planning Act 1967 (later the Environmental Planning Act 1977) on the employment of Black labour, while another 220 000 might have been averted by the rejections of applications for the proclamation of additional industrial land in the metropolises (Dickman, 1991, p 137). If this were true the decentralisation programmes would not have made a net contribution to job opportunities. It is, however, not possible to gauge the verisimilitude of these estimates which cannot but have some conjectural content. Moreover, the relevant question in this regard is whether potential jobs lost or averted, if such there were, should be debited against the gross number of jobs generated, since the debits were, by inference, based upon the assumption that the coercive measures were introduced to oblige prospective investors to move to the designated decentralisation points. When it is contemplated that the measures in question had been in force since, at least, 1945, and would have been continued in any case, the incentive schemes assume the nature of a compensatory policy or gesture. In which case the gross numbers of jobs are the appropriate magnitudes at issue.

Another relevant question surfaces: why should the proclamation applications not be discounted in the same manner as the decentralisation applications? In five of the eight years 1982 to 1989 (or in four of the five years 1983 to 1987) the South African economy, operating in a hostile environment, was characterised by stagnation as reflected by both GDP growth (SA Reserve Bank, 1994, p B-21) and formal sector employment levels (National Productivity Institute, 1997, pp 3, 9). Given these circumstances, the probability is that the RIDP made a reasonable net contribution to the accommodation of labour that would otherwise have remained unemployed. This outcome can be set off against the financial cost (to tax payers) of the incentive packages offered, which amounted to R3186 million during 1982/3 to 1986/7 (Panel of Experts, 1989, p 84).

The RIDP has been adjudged economically inefficient. A panel of experts constituted by the Development Bank of Southern Africa in 1987 reported in 1989 that the politically motivated policy suffered from serious structural defects: the many development points prevented the realisation of the economies of concentration; many of these points had been established

without due regard to the comparative cost advantages of location; and the success achieved at some of these places had been the result of the attractive financial incentives only and not of the economic viability of the projects (South Africa, 1991, p 71). Some of the latter owed their existence solely to the profit that could be realised from the difference between the cash value of the incentives and the cost of labour (Driver and Platsky, 1992, p 9).

It emerges, thus, that the decentralisation programme entailed a submarginal application of economic resources. Partly offsetting this inimical emanation had been the contribution to the economic welfare of the Black labour force by way of (i) the increase in the number of wage-earners and (ii) the employment of some of its members close, or closer, to their places of residence than would otherwise have been realised, thus reducing the intensity of the oscillating migrant labour system. (The welfare implications, in the Pareto paradigm, of the transfer of resources from taxpayers are ignored). This latter reduction, however, had as its counterpart an increased incidence of the commuter system, the participation in which involved the disutility of long travelling time and the concomitant cost, which had to be subsidised out of tax revenue as well. The (defunct) President's Council (1985) found that 20 per cent of commuters had to travel 4½ hours, and 80 per cent 2½ hours daily. However, one survey undertaken in the former self-governing Kwandebele, showed that only one-quarter of commuters were really prepared to move across the border to townships closer to their places of work. And in many cases the travelling times between townships and factory within the Common Area are not significantly shorter. Naude's price tag of R2 000 million per annum to account for subsidies, travel time and accidents, is difficult to evaluate (1984, p 34), but it can be asseverated that the resource cost of production would have been lower had the decentralised urbanisation in question taken place closer to the sources of employment, instead of by way of dormitory towns. The percentage of urban dwellers would also have been larger if those migrant workers who wanted their families or wives with them and who would have opted for permanent settlement in the Common Area had been permitted to do so. Nevertheless, the conclusion that South Africa is, in consequence, "under-urbanised" is not justified in the context of the formal sector of the economy. The value of the factor p in the W.p.s. formula signals the contrary. The proliferation of squatter camps and land invasions, however, provide visual evidence of over-population rather than "over-urbanisation".

5.3 OSCILLATING MIGRATION

5.3.1 The traditional setting[1]

The migration of labour from the Homelands to the Common Area, be it of a permanent or temporary character – the latter with or without oscillation or recurrence involved – accords with economic logic. It constitutes a movement of economically active persons from a Third World to a First World environment, from enterprise- poor to entrepreneurship-better endowed areas, from an underdeveloped agrarian/pastoral economy to an industrial economy, out of areas with high-fertility fast-growing populations towards regions of low-fertility, slower growing populations. It is a function of human numbers, born into an economically non-modernised society, seeking a livelihood in a modern society which is perceived to provide it. The obstacles to economic development in the former are psychological, social and religious (or, comprehensively cultural) in nature, encompassing an entire way of life, which does not engender an adequate supply of enterprise, or entrepreneurship, which is at the heart of economic progress. These ultimate determinants, to be treated of in the next Chapter, involve magnitudes the economist is not qualified to handle with sufficient profundity, but cannot therefore be avoided, if only to demonstrate how economic and demographic forces can almost lose their separate identity in the cultural setting of the traditional society.

The pervasive feature of the traditional setting in the Homelands is, or has been - and certainly when the system of migrant labour was initiated - the rustic peace and quiet of an agrarian/pastoral subsistence society in small villages where time is not money, needs are limited, the action-eliciting acquisitive instinct is underdeveloped, and where, therefore, self-assertion, initiative, the ability to organise, to plan and put plans into action in order to change one's own and society's course of life are not highly esteemed. The mental horizon of the people is limited by their allegiance to the tribe, which is the social unit based on kinship, and whose hereditary chief need not be endowed with progressive leadership attributes. Their anti-rationalist ancestor worshipping religion demands conformism and the honouring of traditional usages and beliefs, and discourages a spirit of enquiry. The instruction of children in age old customs and mores conduces to the perpetuation of cultural conservatism. Without any formal institutions to cater for the poor, the hungry, the sick and the disabled, the security of the individual is guaranteed by the community consciousness engendered by the social

[1] What with changes in economic life within the former Homelands and in government policy impinging upon the movement of people, with 1986 as watershed year, it is difficult to know which tense to use. The historic present is sometimes the most convenient.

Cattle are preferably not sold for commercial purposes or slaughtered for consumption as a regular occurrence. Their number serves as measure of the status and dignity of their owner, permitting him to sacrifice some for ceremonial and ritual purposes to engender good relations with the living and the dead, to dispense hospitality and generosity, and to acquire wives; cattle being the traditional media for the settlement of lobolo (assets handed over to the parents of the bride as confirmation of the marriage contract). For all these purposes scrawny animals (or scrub cattle) will serve as well as any other, as it is the quantity and not the quality that is at issue. For practical purposes, unimproved land remains the sole co-operant factor of production with labour.

Rather than ensuring the success of a crop of maize, sorghum vulgaris or vegetables by applying modern agricultural methods and harnessing the forces of nature, appropriate rituals may be performed, or taboos observed.

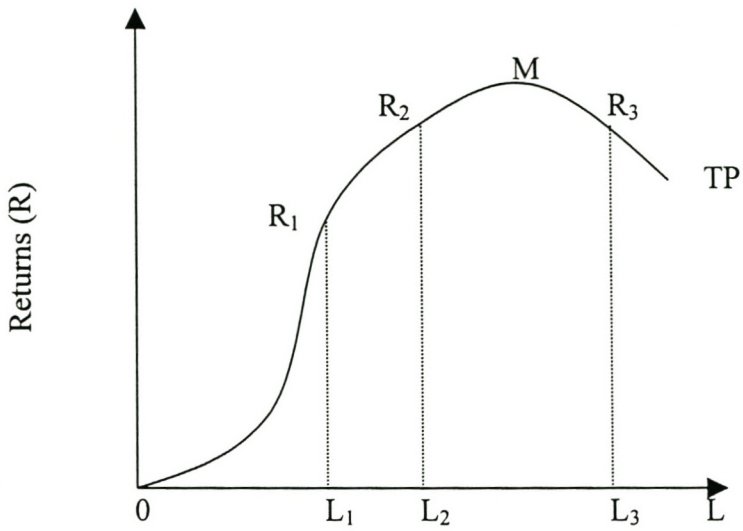
In this setting work for its own sake, and the modern sector phenomenon of unemployment are alien concepts, and strenuous economic activity as a daily routine, at least for men, is not an essential ingredient of the economic scene. Economic activity is purely functional: to extract from the land, when it was still an abundant factor of production, the accepted or conventional living standard; or, when the amount of land per capita had shrunk to a minimum, a modicum of produce. In consideration is the marginal disutility of effort compared to the marginal utility of returns to effort which tends to make a non-event of the opportunity cost of labour.

5.3.2 Economic decisions in the Homelands

In interpreting the evolution, over time, of economic processes in operation as population numbers increase on a limited, almost constant, land area, it would be incongruous to invest, overtly or by implication, the economic subjects with the sophistication normally attributed to decision-makers in a developed economy. They are utility maximisers and not profit maximisers, and rather than marginalities the more blunt or robust magnitudes like aggregates and averages, which can more easily be perceived and appreciated, are the appropriate considerations. These are portrayed in Figure 5.1.

FIGURE 5.1

RETURNS TO LABOUR INPUT



In Figure 5.1 the total product (TP) curve relates the total returns (R) to inputs of family labour (L). Since depreciation allowances for capital are not contemplated and intermediate inputs do not feature prominently, TP will approximate the total amount of income considered available to the household. (It is most convenient to use a year as the reference period.) L is not designated in terms of hours but of numbers of workers available per year which is the equivalent of family size, or the total population when households are summed. Numbers of hours are elastic and can be suited to the needs of the moment. The average revenue or income per member of the family or RL divided by OL, is the desideratum. Acting on the assumption that every new birth can mean an addition to his labour force and since the impact of an additional child - whose survival is also uncertain - cannot be immediately obvious to the head of the household, it is extremely unlikely that family size will maximise per capita income, i.e. to be at the point of maximum average on TP (at R_1L_1) even if the size were a function of such rational economic calculus, which it is not.

As long as the average revenue (R_1L_1, R_2L_2 etc. divided by OL_1, OL_2 etc.) is not less than accepted minimum consumption, or subsistence standards the decision-maker (the head) can still rationally desire additions to his labour force inasmuch as these are substitutes for his own manual labour input, eventually reducing his own contribution in the production process to the exercise of command. Whatever RL/OL may then be, the number of hours actively spent in this function over a period of a year may be so small that the rate of remuneration to the head would be very high. As he is the potential supplier of labour to any adjacent modern sector until, at least, his sons have reached the labour market age of entry, when they will still be substitutes for himself in the family enterprise, the market wage rate would have to be very high, and not just slightly higher than RL/OL, to entice him out of the subsistence sector.

Applying the Tomlinson Report's criteria to determine the amount of land required per family for a sustainable level of reasonably comfortable living, or "subsistence affluence", we find that the population size of the Homelands, with labour (L) as its proxy would have produced average returns approximated by R_2L_2/OL_2, representative of such comfortable living, up to the 1920s. This comparative affluence must have been at the bottom of the perennial complaints about labour scarcity in South Africa over many decades after the genesis of the market sector and, particularly, industrial activity. To ameliorate the situation for potential employers the authorities were persuaded to introduce hut and poll taxes. These forced the Homeland inhabitants into the wage labour market because they had to be paid in cash, which the subsistence farming did not produce, or because they reduced net income to below

acceptable standards. Thus the supply of labour to the market sector was augmented.

In time the need for such measures to secure supplies of labour was obviated by the pressure of population. As population numbers expanded to push the labour force component beyond L_2, the difference between RL/OL (at the micro level) and the total requirements of the family at the conventional consumption level widened, forcing the breadwinner(s) to seek restitution in the wage labour market, temporarily on an oscillatory basis, or permanently if and when TP for the individual family has been reduced to a negligible or zero quantity.

According to Simkins (1983) the Homelands manifested, until around 1955, a condition of "fragile productivity maintenance", the maintenance of output per capita having required a substantial volume of net emigration (of a permanent nature, in our context). The latter, as reflected in the figures of Table 5.4, did not materialise.

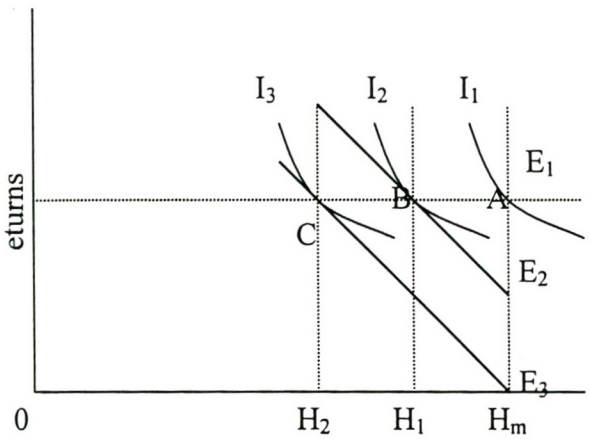
The connection between subsistence farming and wage labour performance finds expression in the income produced in the former serving as an alternative to wages otherwise to be earned in the labour market (given the wage level) and, accordingly, providing some "bargaining power" and, thus, a cushion against the acceptance of wage offers, or periods of employment, considered unacceptable. This is graphically portrayed in Figure 5.2(a) and (b) in which the horizontal axis represents the hours of leisure (maximum Hm) which can be sacrificed for hours of wage labour, and the vertical axis the amount of earnings. I_1, I_2 etc. are the usual iso-utility (indifference) curves.

In Figure 5.2(a) the preferred position of the LF member is represented by the indifference curve I_1, which provides a corner solution where no wage labour is supplied, E_1 representing the required conventional living standard. When subsistence income has declined to E_2, the difference between E_1 and E_2 will have to be earned by spending HmH_1 hours in wage employment. When all subsistence income has disappeared HmH_2 hours of paid work will be required. The leftward shift of the iso-utility curves in the above developments would reflect a loss of welfare. According to Figure 5.2(b) the "reservation wage" is DH_3/HmH_3 when subsistence earnings satisfy the conventional living standard. When these earnings are reduced to E_5, following upon the redistribution of land among ever increasing numbers of households, the reservation wage, born out of necessity, is reduced to FH_3/HmH_3. Their dwindling to a zero amount leaves the LF member with no individual bargaining power against unacceptable wage levels. In the urban areas the support provided by the extended

FIGURE 5.2

SUBSISTENCE INCOME

(a) As alternative to wage labour



(b) As temporary cushion

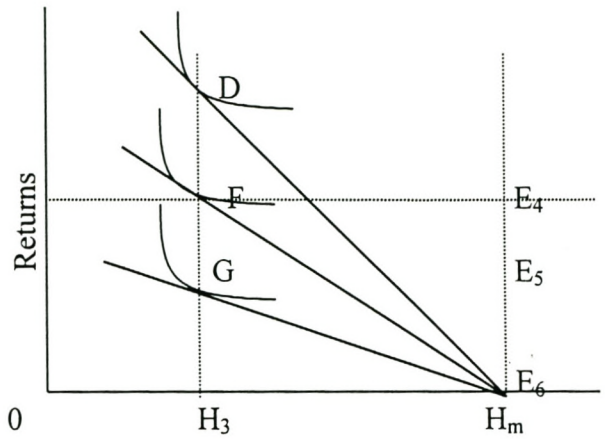
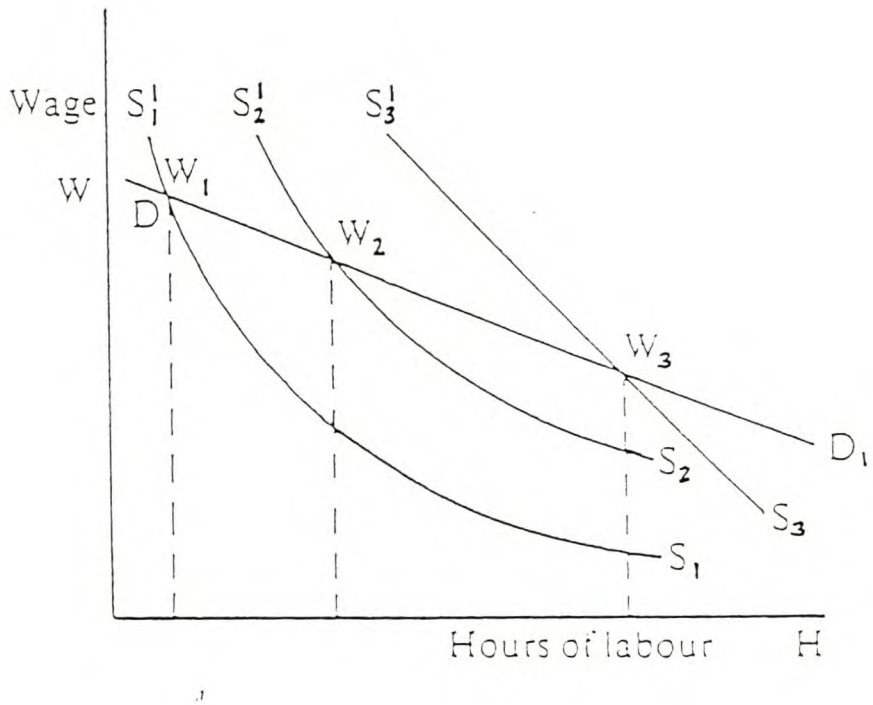


FIGURE 5.3

THE SUPPLY OF WAGE LABOUR



family system can serve the same purpose as subsistence income.

5.3.3 Remuneration policy

In the early days of the mining industry the management held that their remuneration policy should be based on the supplementation principle. In 1889 the Witwatersrand Chamber of Mines maintained that "the high wages now paid are themselves the principal reason for the short supply" (Annual Report, p 10), a point of view also expressed by a witness before the South African Native Affairs Commission (Annual Report 1903 - 05) in 1903. In 1925 the Native Recruiting Corporation, giving evidence to the Economic and Wage Commission, declared that "any increase in the level of Native wages would be followed ... by ... a shorter period [of work] than at present ... and that, consequently, Native labour available to industry in the Union would be reduced" (Report 1926, p 58). Subsumed in this line of reasoning was the premise that the workers' demand for income, with respect to effort price, was completely inelastic. This is represented by the backward-sloping labour supply curves S_1, and S_2 in Figure 5.3, in the shape of rectangular hyperbolas describing an elasticity equal to -1 (WH a constant amount). While this interpretation evokes the criticism that the workers involved could not have been so limited in their wants, this cannot be said of conduct which is

associated with a supply schedule of labour such as S_3, the negative elasticity value of which is less than 1 but more than zero, which is still backward-sloping, and which fits the situation depicted in the quotations above. Rather than limited wants it describes behaviour which allows of an improvement in living standards by way of an increase in both wages and leisure.

At the macro level, over time, the horizontal movement of the supply curve away from the origin means lower earnings per person as long as the demand curve for labour, DD_1 is sloping uninterruptedly downwards, and the short-run demand curves, intersecting the supply curves, do not move upwards to the extent of compensating, or more than compensating, for the supply curves' sideways course as population increases. The originally dominant industry in the lives of the migrant labourers was gold mining, and here the compensatory action at issue did not occur, since it was pre-empted by shifting the supply curve to the right by way of the recruitment of foreign labour, as described in the previous Chapter. Given the geological variability in the gold content of the ore, the life of mines has been prolonged by means of restraining labour costs, which allowed of the mining of lower grade ore. The scarce factor of production, the natural resource, was economised upon and the abundant factor - more correctly, rendered abundant by recruitment in neighbouring countries - used more liberally. The mining industry, which during the first few decades of its existence constituted either a monopsomy in the labour market or a wage leader, did not have to face meaningful competition. Management would no doubt have been considered very eccentric if they did not react rationally to the backward sloping supply curve of indigenous labour, and to labour supplies available in neighbouring countries. Moreover, as the pressure of population on the limited agricultural land in the Homelands grew in severity, increasing numbers were left with no option but to offer their services in the labour market without the cushion of an income, or a meaningful income, from the land. Hence the remarkable performance of the real wage level which, according to one author, declined between 1911 and 1931 and remained constant thereafter until 1969 (Nattrass, 1981, p 139). In the view of the radical historians of the 1970's this signified that the subsistence economy, by assuming a portion of the burden of maintenance and reproductive costs of migrants and their families, was virtually subsidising the urban economy by way of low wages and low-cost residential accommodation of single men, instead of entire families (Nattrass & Nattrass, 1990, p 518).

It needs to be added that when the price ceiling of gold lifted as a result of the functioning of the international free market, this was very soon reflected in the wages of Black mineworkers which more than doubled between the beginning of 1973 and the end of 1974. This also

improved the position of the mining industry to compete for indigenous labour with Manufacturing which, as an import substitution industry protected by import control, did not suffer the labour cost concerns of Mining.

5.3.4 The origins of oscillation

From the discussion above it emerges that the origins of the oscillatory migration of workers, the migrant labour system that is, can be traced back to the following circumstances: the inelasticity of the demand for income; the attachment of the Homeland Blacks to their land which provided some security in the post-retirement stage of life for those who had or still have it; and the sizeable landholding per capita when the number of inhabitants were still small and, accordingly, rendered the participation in the wage labour market an activity of a supplemental nature. With influx control until 1985 so obviously inhibitory of permanent migration there has always been the temptation of presenting, uncritically, oscillating migration as uniquely related to it. In fact, by the time this control was instituted the system had already been well established, having been in operation for longer than half-a-century. By 1961 the gold mining industry was still arguing in its favour, contending that "it enables him to earn the money he needs and at the same time allows him to retain his roots in the tribal territories..... To introduce the tribal Native suddenly to a complex industrialised civilisation and at the same time to deny him the benefits of the traditional laws and social customs of his tribe would be to do him a serious disservice". (Gemmill, 1961, p 1). The preference for temporary workers was at times supported by the argument that gold mining was a wasting industry whose life was limited and would leave a stabilised labour force stranded when the supply of exploitable ore was exhausted.

A sociologist found that the division of labour among the Mozambican Thonga tribe "followed closely the general pattern common to most of the Southern Bantu. Most of the agricultural tasks were regarded as ideally women's work. In the agricultural sphere only the felling and burning of heavy growth was designated as a proper male activity. This division of labour between the sexes provided the European economy with the basic ingredients for a system of migratory labour" (Harris, 1959, p 2). Around the same time an industrial psychologist maintained that "participation in tribal life ... [is] still the principle motivation of the tribal labourer. When he must work he adopts the migratory work pattern by preference, as causing the least disturbance of his traditional way of life. For this type of labourer the loss of leisure is a major deterrent against continuous employment in White areas. Employment on the mines is attractive to him because the work periods are limited and because all the

problems in obtaining a job, getting to it, and finding accommodation, are taken care of ... He lives in a protected, paternalistic society ... life is not so different from that led in the tribes" (Biesheuvel quoted in Gemmill, 1961, p 3). Economically, it can be interpreted as a desire for a consumption mix which contains elements of both the traditional and the modern. The greater freedom of the migrant to spend for own gratification, when not accompanied by his family, seems to have an attraction for him. One author's finding that the propensity to remit (to his family at home) is a diminishing function of time, is relevant in this regard. (Penny 1986, p 300). He would be subject to the danger of forfeiture if he took his wife with him to his place of work leaving the land (to which he is entitled as a member of a tribe) uncultivated (Mining Survey, 1986, p 43). Clinging to the land can be interpreted as risk aversion. "If a man were to withdraw permanently from the countryside", observed Elkan (1959, p 195) "he would be giving up both a part of his income and also a form of insurance against unemployment or ill-health". Again, the permanent departure of an unmarried woman would mean the loss of lobolo (bride price) to the parents, for the payment of which, amongst others, unmarried men join the migrant labour system, which, at the same time, is an initiation into manhood (Schapera, 1947, p 16). The tribute payable to chieftains and headmen also meant that they have a vested interest in the return of the migrant and would, therefore, encourage it. Furthermore, within the Homelands where no influx control existed, men "of two worlds" - the rural and the urban, with a family in both - are also encountered.

The feelings about the appropriateness of life in the cities for their children, as entertained by parents, working and/or living in urban areas outside the Homelands, are conspicuously manifested in the large numbers of pupils sent to be educated in the latter areas. The estimates for 1985, coinciding with the census of that year, are detailed in Table 5.5.

TABLE 5.5
CHILDREN OF COMMON AREA RESIDENTS COMMITTED TO THE CARE OF RELATIVES IN THE HOMELANDS

Age	SGT		TBVC		Common Area	
	Male	Female	Male	Female	Male	Female
5- 9	52 400	53 400	42 600	43 400	-95 000	-96 800
10-14	78 000	79 600	62 300	63 500	-140 300	-143 100
15-19	52 300	53 700	41 800	42 500	-94 100	-96 200
TOTAL	182 700	186 700	146 700	149 400	-329 400	-336 100

Source: Sadie, 1991, p 10.

They reveal that in that year 665 500 children had not been living with their parents in the Common Area.

The views on the migrant labour system of (i) workers participating in the system; (ii) former participants and (iii) the wives of migrant workers, were canvassed by the Human Sciences Research Council in 1977. The Council sounded a caveat that it was not clear whether the migrant believed in the system as an alternative to other possible systems of labour performance or as the only arrangement whereby he could participate in the wage labour market (S-N-105, p 33). The results are summarised in Table 5.6.

TABLE 5.6
VIEWS ON THE MIGRANT LABOUR SYSTEM
POSITIVE RESPONSES PER CENT

WORKERS PARTICIPATING	%
System to be retained	81
Will continue to participate	81
Will recommend it to others	71
EX-MIGRANT WORKERS	
System to be retained	76
Will recommend it to young men	73
A good thing to be away from home for a period	61
WIVES OF MIGRANT WORKERS	
System to be retained	74
Wives ought to accompany their husbands	10

Sources: P A Erasmus, 1977(a) Table 21; 1977(b) Tables 4, 5, 6; 1979 Tables 1, 8.

It is obvious that all three categories of respondents expressed themselves in favour of the system by large majorities. In the survey among ex-migrants 75 per cent of married men and 65 per cent of non-married men stated that they would advise young men to work in the Common Area. If we discount the significance of these results in view of the HSRC caveat, the responses to two questions: "a good thing to be away from home for a period" 61 per cent, and "wives ought to accompany their husbands" 10 percent, do not reflect an aversion to the system on the part of a majority of those ostensibly harmed by it. And if the psychic cost of migration can be interpreted as "the agony of departure from family and friends", as one writer would have it (Schwartz, 1973, p 1155), the temporariness of the absence of the migrant worker must be a redeeming feature.

Giliomee and Schlemmer (1985), who conducted a survey among migrants to determine their preferences about having families within easy reach, reported the following results:

	Non-acquiescent group	Acquiescent group
	%	%
Already have families with them	33	1
Desire to have wife nearby	29	38
	62	39

To determine the outcome for the universe we can allot a weight of 3 to the acquiescent group (at a minimum) compared to 1 for the other - in the light of the information of Table 5.6 - to arrive at 45 per cent for the aggregate who would have wanted, or already had, their wives and/or families with them when influx control was lifted as from 1986. The implication was that a maximum of 623 000 migrants or, together with their families, 3 300 000 persons, could have been induced by the new dispensation, to become permanent urban dwellers in the Common Area. The urban data for 1985 and 1991 would indicate that the volume of migration as computed above had not quite been realised. Simkins' (1983) estimate of the number that would be involved was between 1,5 and 3 million.

In 1986 Penny would have it that there was little evidence of a desire "on the part of migrants to relocate permanently within commuting distance of their employment" (1986, p 292). In 1982 Ehlers had found that among commuters from the southern region of Kwandebele no more than 22 to 26 per cent were prepared to move to a township house close to their places of work (1982, p 44).

Accordingly, the abolition of influx control did not end the migrant labour system.

5.3.5 Migrant labour productivity

Manufacturing industry, which has always been in favour of settled labour and campaigned for the demise of the oscillatory system, stressed the productivity-deficient nature of migrant labour. At the beginning of the 1950s, before the contract system was vigorously enforced - work contracts attested in the Homelands required for leaving home and imposing his return when the contract period (usually a year) had elapsed - the Tomlinson Commission calculated that during his working life, starting at age 18, the average migrant would have divided his time between wage-earning and non-earning periods as follows (1955, p 96):

	Mine worker		Worker in secondary and tertiary sectors	
	Months	%	Months	%
In wage earning employment	15,0	52,8	23,5	61,9
Spent at home	8,0	28,0	6,2	16,3
Resting elsewhere	5,5	19,2	8,3	21,8
		100,0		100,0

Ending his participation in the system at age 60 he would have filled 8 posts in 5 different occupations, each new spell of wage labour representing the start of a new career, as it were. Over time the pressure of population on the land produced freely committed migrants whose periods of non-wage activity or rest shortened, reducing somewhat the loss of competency occasioned by his not exercising his trade. The impermanence obliged by the need to return home at the end of the contract period, however, remained an obstacle, it would seem, to a commitment to the acquisition of a skill in one occupation and to one employer or industry, which could have allowed him upward movement in the skill hierarchy of a firm. It is possible that the system conditioned the migrant to a routine which inhibited the contemplation of acting like a non-migrant, settled, or permanently urbanised, worker, viz. finding a job that shows promise, acquiring experience and skill during the contract period of a year or longer, taking, like any other employee, a holiday to which ordinary workers are entitled to, during which he pays a visit to his area and origin, returning to the same job and employer with a new contract, to accumulate, by repetition, the know-how and efficiency required for production.

Of course, the employers, on their part, might equally have been conditioned to regarding the migrant as a person in whom investment was not merited. Accordingly his potential remained underdeveloped. The gold mining industry's spokesman stated that "with a labour force of migrants involving a turnover of approximately 100 per cent per annum and without knowledge of when a particular labourer will return, if at all, to mining employment, there has been little incentive to develop such skills" (Gemmill, 1961, p 2). At one or other stage it must have been realised that there was indeed a way of diminishing, if not overcoming, the deleterious effect on productivity inhering in the obligation to return home at the end of the contract period. During the 1960s the Kimberley diamond mines introduced the call-in card system. On going home workers were handed a card which would be mailed when they wanted to return, after which they were recalled when management could incorporate them back into their labour force. This still left unresolved the problems of uncertainty about the duration of the rest periods between spells of work and, accordingly, arranging their return to

the jobs they held prior to their departure on holiday (Lipton, 1980, p 130). In the late 1970s the Gold Mining industry improved on this scheme by granting workers paid leave of 12 to 28 days a year after a spell of 12 months of employment, keeping their jobs open and paying them bonuses for returning on time, in order to engender a commitment to a mining career. Records were kept of each employee's length of service, skills, remuneration and the mining company he has been associated with; data required to operate the labour force stabilisation project. The Chamber of Mines reported that their scheme met with success.

With such schemes in operation the productivity-inhibiting attribute of migrant labour becomes a function of the attitude of the employee. He could, conceivably, regard his freedom to decide on the duration of the period of rest, or economic inaction, between rounds of migrant labour performance, as of prime importance.

It can be noted that Black workers used to be considered superior to Coloured persons in the performance of manual labour in the Western Cape which had been declared a Coloured Preference Area as part of the influx-control policy. It was commonly attributed to their fear of being endorsed out if their performance was below par, or if they changed their jobs too often.

In an economy characterised by high unemployment the migrant labour system is not without merit: it represents a system of work sharing which provides jobs to more persons than would be true of stabilised (permanent immigrant) labour. For example, keeping 1 000 jobs constantly filled by migrants working spells of 12 months, would require a pool of 2 000 if the resting period entails a regular departure rate of one quarter of the LF each 3 months. Variability in the duration of the periods of time will increase the number of workers who will share in the wage employment. Lipton quotes the example of a mine in Namibia employing 5 250 workers who were drawn from a circulating pool of some 12 500 (1980, p 150), each of whom could therefore earn some income some time.

5.3.6 The effects on Homeland agriculture

There appears to be a temptation, not only to relate the performance of Homeland agriculture to the migrant labour system, which is logical, but to blame it as a unique determinant. There is, for example the uncompromising pronouncement by one author that the inner periphery (the developed sector) "has been directly responsible for the underdevelopment of the outer periphery, the Black Homelands, primarily by undermining their productive capacity and their

self-sufficiency by draining them of their able-bodied labour through the encouragement of the migrant labour system" (Bundy, 1979, quoted in Fair 1982, p 75). From Lesotho, where the dependence of the economy on the South African mines is a byword, we have this non-dogmatic observation: "The uni-dimensional linkage between migration, labour shortage, low agricultural productivity and low incomes in rural Lesotho is somewhat tenuous" (Matlosa, 1992, p 92).

There should indeed be some causal connection between migrancy and under-achieving agriculture: that which ensued from the enforced part of the oscillatory process (less than half), which inhibited the permanent emigration of some families and caused a subdivision of a limited amount of agricultural land into sub-economic units among ever-increasing numbers of families. But even in this case, what with the high incidence of voluntary migrancy, the extent of the impact, if any, is uncertain.

When we deflate the data on agricultural production reflected in Table 5.3 with the price indices derived from the national income statistics for the country as a whole (SARB, 1994) – in the absence of better information – we arrive at the following average annual rates of growth for the period 1970/71 - 1989:

SGTs	
	% p.a.
Market production	10,6
Non-Market production	1,3
Aggregate	3,5
TBVC	
Market production	12,4
Non-Market production	1,9
Aggregate	4,6

The rates of increase in agricultural production for the Homelands as a whole was slightly better than that of South Africa as an entirety (3,5 per cent per annum). This was, however, very much the result of a very rapid expansion in commercial production, which started off from a very small base and remained the lesser component. The non-market, or subsistence, component continued at a leisurely tempo. But more important than the growth rate of Homeland agriculture has been its very meagre contribution to the aggregate South African production, viz. 9,4 per cent in 1970/71 and 8,7 per cent in 1989. This can be compared to the 19,8 per cent potential of the Homelands as constituted in 1954, when this area comprised

13,8 per cent of agricultural land, and which would have risen to 23,2 per cent after a 22 per cent pledged addition to their surface area. The Tomlinson Commission estimated that 100 hectare in the Homelands had the same potential, on average, as 147 hectare in the rest of the country (p 117). This was a conservative estimate. The Transkei, for example, with one quarter of South Africa's water resources and higher than average soil fertility, should produce enough food to become a net exporter but in fact meets only 30 per cent of its requirements, while realising no more than 10 per cent of its potential (The Africa Institute of SA, 1987, p 8). This was not for lack of effort on the part of central government to promote the productivity of subsistence agriculture, the usual complaint about which, however, was that they were implemented for instead of with the people. The Annual Reports of the (now defunct) Department of Co-operation and Development are replete with examples of projects undertaken by the department to induce advancement of this sector: the reclamation and conservation of millions of hectares of land, more than 100 000 kilometres of fences put up for grazing camps and farm layouts, thousands of boreholes sunk and dams built, the settling of farmers on economic units, improvements in stock-breeding, the introduction of fishbreeding and non-traditional crops, particularly industrial fibres (such as sisal) and sugar cane. The results appear to be shown up preponderantly in the growth of market production of these areas.

Theoretically, the remittances of migrant workers to their places of origin should have a beneficial effect on the growth of agriculture in the latter; and at least one writer believes that the "pervasive pessimistic view of the developmental role of remittances reflects misguided theoretical thinking" (Stahl, 1986, p 915). But scholars seem to be "divided in their judgements concerning the effect of the use of remittances in the development process" (Appleyard, 1989, p 498). It would seem that in practice, the world over, the function of remittances is to maintain, or perhaps raise, the consumption level of families or households only, and not to contribute to growth by way of financing capital formation. The following judgement of the Food and Agricultural Organisation (FAO) of the United Nations is revealing: "The analysis of long term migration dynamics shows that it is not likely that migration transmits economic growth from urban to rural areas; that it has no appreciable effect on the strategic variables of development; and that it may even become a drain on the long-run economic growth in the sending areas" (United Nations, 1984, p 199). Griffith (1986, p 392) would concur while Keely (1989, p 500) concedes that the converse of the pessimistic view "should not be overstated".

A survey among 1 200 South African miners in 1979 found that remittances accounted for 88,4 per cent of the average household annual income. However, there was a fairly extensive leakage, from the point of view of the Homelands, in that 43 per cent of the earnings of the migrant was spent in the area of the workplace, and did not therefore contribute to the GNP available within the Homelands (Penny, 1986, pp 299-300). The leakage increases as the migrant grows older, and in some regions of the country the leakage was found to be still larger than the above 43 per cent. The remittances served as support for levels of consumption, the composition of which was being changed by the availability of cash which was channelled to the "imports" sold in shops, and away from traditional sources of food. In those cases where portions of migrants' earnings were "invested" from their individual point of view, it did not constitute capital formation, but an accumulation of existing assets in the form of land and cattle and, accordingly, a redistribution of wealth among members of the community.

A pertinent question arises: confining the argument to voluntary oscillation, is the system an object of blame, responsible for underdeveloped agriculture, or is it an object for the bestowal of gratitude for sustenance which would otherwise have been lacking? The weight of evidence supports the latter view.

The argument most often used against the system was that it drained the Homelands of able-bodied men who were, in consequence, not available to attend to the needs of agriculture. Leaving aside the matter of the direction of causation, the relevant statistics in Table 5.7 do not support the contention.

TABLE 5.7
1985 MIGRANT LABOUR FORCE PARTICIPATION RATES (MLFP)

	SGTS		TBVC	
	MALE	FEMALE	MALE	FEMALE
15-19	,159		,178	
20-24	,359		,362	
25-29	,456	,065	,440	,066
30-34	,454	,094	,453	,091
35-39	,437	,121	,435	,072
40-44	,420	,134	,414	,062
45-49	,394	,140	,349	,056
50-54	,386	,137	,331	,057
55-59	,371		,285	
60-64	,352		,254	
65-69	,217		,139	
70-74	,043		,023	
Gross years of MLFP	20,2	3,5	18,3	2,0

Source: Sadie, 1991, p 11.

At the height of migrancy, in 1985, fewer than one-half of the potential manpower in every age group were engaged in migrant labour performance. The gross years of MLFP of 20, 2 years for the SGTs signify that the average male spent 36,7 per cent of his potential working-life (55 years between age 15 and 70) in MLFP. The proportions were lower still for the TBVC countries, and very much lower in the case of females. Table 5.8 provides us with an historic overview of the number of absentees involved in the system on the dates of the various censuses.

TABLE 5.8

Date	**Number of migrants**		**% of males' working life spent in migrancy**
	Male	**Female**	
			%
1911	193 000		28,0
1936	444 000		34,0
1946	478 000		33,3
1951	528 000		35,6
1960	507 000		31,1
1970	757 000		33,8
1985	1 342 000	194 000	35,9
1991	1 261 300	209 600	24,0

Source: Sadie, 1977, p 16 and 1991, pp 11, 14.

For half a century male inhabitants of the Homelands had been spending approximately one-third of their potential working lives in oscillatory labour performance. We see a reflection of the abolition of influx control in the lowering of the proportion between 1985 and 1991. It is not possible to determine, for a recent date, how much of the two-thirds of potential working life had been spent outside the Homelands or as commuter workers, but it is highly unlikely to be extensive; and MLFP cannot be blamed for it. Given that some mutual aid is being dispensed in the Homelands, there should have been sufficient male manpower at any point of time to perform the duties not normally handled by women and children. Of course, it is possible that male migrants may consider themselves entitled to a complete rest in between spells of migrant labour, which would exclude attention to agricultural chores.

Basically it reflects a disregard for subsistence agriculture which finds itself in a no contest situation *vis-a-vis* MLFP. When households have become used to its contributing no more than 11,6 per cent of their income, as indicated above, it is reduced to the status of a not very significant supplementary source of food which cannot lay claim to some dedication on the

part of the landholder. In a Ciskei village it was found that fewer than one-half of allotments were cultivated in 1980/81, and when an irrigation scheme was provided as part of a betterment project, it took several years for all the available sites to be taken up. (De Wet, 1982, p 22). The opportunity costs of entering into such an improved venture - as represented by the potential earnings in MLFP - were too high. One author maintained that the Homeland inhabitant "was not economically irrational when he rejected a government plan to increase agricultural production. He selected his more profitable opportunity when he chose to migrate temporarily, leaving his wife and family to cultivate his land, instead of accepting the government's offer to help him invest his time and wealth in full-time farming" (Rutman, 1974, p 29).

Perhaps the crucial judgement was delivered by the Tomlinson Commission, in their seminal work on the development of the Homelands, which found that "the male Bantu has never been an arable or livestock farmer in the Western meaning of the word, and because of the historical development of this country, he has never been obliged to become a farmer. He apparently prefers to be an employee of the European rather than a real farmer and tiller of the soil. .... If the name `farmer' can be applied to the Bantu, the Bantu women alone can lay claim to it" (1955, p 73). This has been disputed by, among others, Bundy (1979) who drew the attention to the peasants who responded more effectively to market opportunities at the beginning of the century than White pastoralist-cultivators, and that the Land Act of 1913 was an attempt to limit the competition, and release labour for the mines. This latter attribution was somewhat selective since tribal chiefs, fearing the loss of their authority emanating from the cash income of their subjects, discouraged the initiative displayed by some of them. The progress in market production, like that of more recent years, as reflected above by the 1970 - 1989 data, was not a societal phenomenon but the result of individual and government initiative, the core of peasantry remaining largely unchanged. At the beginning of the century the amount of arable land per capita had been three-and-a-half times that prevailing in 1970 and eight times that of 1991. Agriculturally viable landholdings were still possible.

In the last resort, from the point of view of efficient agriculture, the communal land tenure system is basically flawed. The one-man-one-lot principle involved ensures that the larger the population the smaller the allotments would be, rendering it eventually impossible for the average landholder to make a full-time living off his farming activities. The land is not a negotiable asset which can be used for securing credit. It cannot be sold to individuals who might want to procure viable farming units. By inference, it assumes that every breadwinner

has the talent and desire for farming, a non-selectivity which effectively pre-empted the development of a healthy and progressive agricultural sector. Since land belongs to everybody it belongs to nobody: conservation is a futile exercise for individual pastoralists. Soil degradation ensues. Agriculture is rendered a way of life instead of a way of making a living. And the migrant labour system becomes institutionalised as part of life's routine.

Enlightening in this regard is the finding of Senghaas (amongst others): "A review of European and extra-European development history during the nineteenth and early twentieth centuries shows a clear correlation between agricultural modernisation and successful industrialisation, or else between the lack of agricultural modernisation and the failure of industrialisation" ... rendering "persistent subsistence agriculture and industrialisation ... mutually exclusive" (1985, p 47). In the densely populated agrarian countries agricultural modernisation was initiated by moves towards farming units of economically sensible size, guaranteed access to land, legal security of ownership and tenure and freedom of disposition (p 54).

Arising from their own analyses the Tomlinson Commission (1955, Chapter 3(a)) recommended that the one-man-one-lot system be abolished and replaced, wherever practicable, by a system of freehold title to land purchased by individuals at an economic valuation. As it happened, traditionalism and inertia triumphed while the central government preferred not to disturb the social fabric woven around this development-inhibiting communal system. More recently, the latter stance appears to have gained some support. One researcher, for example, contending that there have been numerous instances of failed attempts at individual tenure in Africa, and that wage work was likely to remain the economic base of the great majority of rural Black Society in South Africa, concluded that full-time agriculture was not a feasible development strategy for the latter (Cross, 1990, pp 549, 551). He argued that "what people want from the land system is both sane and sensible ... the kind of basic amenities that urban communities now have, without having to forgo their land-based community and the social links that make up their survival networks" (p 551). Whether the realisation of these wishes – which appear to require a programme of action having the makings of a replication, or more costly variation, of the defunct decentralisation policy, or simply an exorbitant transfer of economic resources – appertains to the realm of economic sensibility and feasibility, from the fiscal or private enterprise point of view, is a moot question.

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CHAPTER 6

THE ENTREPRENEUR

6.1 IDENTIFYING THE ENTREPRENEUR

In a study of economic growth and development causality can be analysed at two levels: the proximate and the ultimate. At the former level economic phenomena are related to economic and demographic determinants; at the latter the explanatory variables assume the nature of social, religious, psychological and political forces. The entrepreneur occupies the centre of the stage. When the ultimate forces have included an adequate or reasonable supply of them, their activity permits of economic phenomena being analysed at the proximate level. The supply of enterprise is assumed as given.

In the most general terms the entrepreneur is the executive who initiates economic activity which adds to the GDP of his community and country. As the prime mover in economic growth and development and as co-ordinator of the factors of production, he perceives economic opportunities, evaluates them and invests in ventures in accordance with his assessment. Abstracting from the State as entrepreneur - which is the rule in the command economy, but can also occur in predominantly private enterprise systems - quite an array of entrepreneurial types can be identified, whatever reservations one may have about the quality status of some of them. At the lower end we have the most modest such as the peasant farmer who is allocated a piece of land because he is a member of a tribal community, and not because he is a farmer, and the self-employed street vendors, hawkers, petty traders, bootblacks, self-appointed parking attendants, backyard operators, etc. in the informal sector, most of them in occupations-of-last-resort. They do not impart dynamism to the economy. At the upper end of the scale there are the captains-of-industry portrayed by Schumpeter (1961, p 93) as somewhat heroic characters motivated by "the dream and the will to found a private kingdom ... the will to conquer; the impulse to fight, to prove oneself superior to others, to succeed for the sake, not of the fruits of success, but of success itself ... and the joy of creating, of getting things done or simply exercising one's energy and ingenuity ... our type seeks out difficulties, changes in order to change, delights in ventures ... motives distinctly hedonist...." Of these outstanding characters there are relatively few in South Africa, as in most other societies. In between these extremes we have the large majority of entrepreneurs of greater and lesser stature who are either self-employed in the formal sector of the economy or

are employees responsible for the ultimate decisions and initiatives of enterprises. In corporate business most of them have attained that status by graduating upwards in the occupational hierarchy. These persons (modal entrepreneurs) operate at the executive level and are responsible for generating the bulk of the GDP. In agriculture, practising commercial farmers or their managers qualify for the description, though their attributes may differ somewhat from those obtaining in the secondary and tertiary sectors of the economy. All of them are our *dramatis personae* in the process of economic growth and development.

The ensuing question, for our purposes, is then: why are some communities not as well endowed as others with this factor of production?

In broad terms we can distinguish three categories of promotive, alternatively impedimental, factors involved in the genesis of these strategic characters: (i) Politico-historical factors; (ii) Cultural attributes; (iii) Some specific demographic forces. In as much as the exploration below is conducted primarily by way of juxtaposing populations of African and European extraction (without thereby detracting from the contribution of people of Indian origin in South Africa) the contextualisation is handled accordingly; which entails the acceptance, among others, of the experience of, and evidence from Africa as pertinent. In this connection the terms "Black" and "African" can be used interchangeably when dealing with the South African situation.

6.2 POLITICO-HISTORICAL FACTORS

6.2.1 Africa

One can conceive of historic events in the life of a community acting as antecedents to economic growth and development. The time elapsing between the occurrence of inchoate preconditions (whatever they may be or presumed to be) for economic modernisation and the emergence of adequate or reasonable supplies of entrepreneurship, can be labelled a period of gestation. It is a time-involving nurturing foundation. Contrariwise, a people may have a history of events imposed upon them, which created an environment inhibitory of progress, in which case the termination of the conditions in question could be considered an impulse which could, potentially, usher in a gestation process. "It is easy to forget" wrote Rostov (1960, pp 258/9) "that before the Industrial Revolution came to Western Europe and the United States it was preceded by several centuries of commercial and ... industrial development, which had formed a class of private entrepreneurs prepared morally,

intellectually and technically, to exploit the potentialities of the innovations that came forward". And as Frankel (1953, p 69) observed: "What is involved is neither just another ready-to-hand goal of action, nor the transfer of a new set of techniques, but the necessarily slow growth of new aptitudes and new ways of doing, living and thinking".

The history of Africa has provided evidence to the exponents of the World-Systems Perspective (WSP) on Social and Economic Development, in which the dependencia theory can be included, for their contention that the underdevelopment of the Less Developed Countries (LDCs) should be sought in external forces subsumed, in their view, under the capitalist system: colonialism, racism, war, genocide and the like, all of them both effect and cause of the disparaged system (cf. Chambua, 1994, p 40). The era of colonialism was preceded by centuries of trans-Atlantic and across-the-Indian Ocean (Arab) slave trade. On the African side tribal rulers waged internecine wars against one another to provide the supplies of human beings involved in the trade. Apart from draining the continent of a significant portion of its population and labour force – one estimate a figure to it of 20 million (Soyinka, 1994, p 206) – it entailed a "brutalisation and demoralisation of human relations and the implicit breakdown of fair transaction rules, and social disintegration" (Himmelstrand, 1994, p 22). Obviously, this was not an environment in which development could take root.

Neither did the subsequent colonial system provide the required beneficent milieu. It was, primarily, not calculated to benefit the colonies, which, according to the WSP exponents, in particular, were regarded as sources of cheap raw materials, as markets for the industrial products of the colonial powers, and as targets for profitable investments. "Indigenous entrepreneurship", writes Ikiara (1994, pp 122/3) "was stifled to give room to the colonial settler communities and other non-indigenous commercial and manufacturing concerns" and accordingly, "entrepreneurship and mercantile endeavours were virtually monopolised by the colonialists" (Himmelstrand, 1994, p 29), so that the colonised Africans, who could not accumulate wealth through entrepreneurial activities, "became stepchildren to the foreign innovations" (Nyang, 1994, p 433).

The colonial powers have also been accused of not having developed appropriate institutional structures; and when political independence was granted to the colonies they had not been adequately prepared by the departing Europeans to manage, administratively and politically, a post-independent modern state (Mbaku, 1998, p 7). A proper foundation for indigenous economic development would not have been laid.

However, colonialism also allowed Africans contact with, at least, the trappings of economic modernity, if not the soul of economic development. And the mechanics of this development were not a closely guarded secret. That this did not, apparently – judging by decades of stagnation – rebound to their advantage, Omotoso would attribute to the failure of African elites and leadership to communicate the contents of Western culture and technology to their people in their own indigenous languages (1994, pp 116/7). The Japanese, the Newly Industrialising Communities (NICs) of the Pacific Rim and the Arabs of Egypt are cited as examples of peoples "who have encountered Western culture and benefited from it" by deliberately rendering "Western texts into their own languages" while "there is no example ... of Western culture and technology being absorbed through an indigenous language in any African country South of the Sahara – apart from among the Afrikaners in South Africa" (p 117). Another African, Prah, concurs: "... mother tongue education" he declares, "is the missing link in our development efforts on the African continent. It is the enabling factor in the search for a workable paradigm for African development ... Written cultures have a more precise collective memory [than the oral tradition] ... the culture of the spoken word is limited and places a low ceiling on cultural development" (1995, pp ii, 12).

Having experienced the oppressive and exploitative attributes of capitalism, the post-independence leaders harboured feelings of aversion to it and many opted for systems and styles of government of a socialist nature. These, ostensibly, had to reflect or symbolise "Africanness" or "the economy of affection", and assumed such forms as the Consciencism of Nkhrumah, Nyerere's Ujaama, Senghor's African Socialism and Kaunda's African humanism (Omotoso, 1994, pp 123125; Nyang, 1994, pp 429/430; Hydèn, 1986, pp 57-63). But "irrespective of the particular paradigm or school of thought that has informed the particular policies, strategies pursued by a specific sub-Saharan LDC, the end result has been the same, i.e. the failure of liquidate underdevelopment ..." (Chambua, 1994, p 37).

Harsh judgements have been passed on the new political elites of many African countries who had scant regard for democracy. They were indicted of seeking wealth in "the political systems ... into cleptocracies" (Himmelstrand, 1994, p 29); and they defended "a costly and corrupt lifestyle which contributed to stifling the productive and distributive investments needed for economic and social development" (p 14). They tended "to view the mass of people as ignorant, primitive, lazy, superstitious, resistant to change and backward. Thus, for development to take place, it was necessary to defeat the working masses by concentrating the

powers in the state and eroding the independence of the civil society" (Chachage, 1994, p 55). The situation depicted thus brought to the fore the suggestion that the way out of under-development was through the establishment of a broad democracy which would release the creativity and self-organisational capabilities of the working people. Support for this inference could have been garnered from the Italian experience. Research has, namely, revealed that the North/South difference in economic performance was positively associated with the levels of civic engagement which was related to active participation in public affairs in concomitance with political equality, solidarity, trust and tolerance and social structures of co-operation. Civics was found to have had more predictive power of present levels of socio-economic development than had past levels of economic development (Putnam, 1994, p 53).

The Economist pointed out that while the positive association of democracy with the promotion of growth was not incontrovertibly applicable to all societies – the East Asian tigers cannot vaunt very democratic governments – it quotes a study by a former World Bank official (which used an econometric technique to test the direction of causation) that demonstrated civil and political freedoms, like economic freedom, to be promotive of economic growth (1994, p 14-17). If, in the above context, "the whole idea of democracy and popular empowerment is an idea which has come of age in present-day Africa" (Prah, 1994, p ii) is auguring a new economic dawn, the 1990's and not the 1960's, would have to be regarded as marking the beginnings of a potential period of gestation. The rather exceptional GDP growth rates of around 4 per cent experienced by sub-Saharan Africa during 1995-1998 (IMF, 1997, p 153) engendered some optimism about its economic future. And the successor of Mandela proffered an optimistic scenario of an African renaissance (Mbeki, 1998, p 9). However, an American professor writing on the "bright and the dark sides of Africa" noted that the democratisation process, which began auspiciously in the early 1990s, had gone into reverse in some countries, many of which have democratic constitutions but only a few of them practising true democracy (Hull, 1998, pp 8-10). Another writer, explaining how "bureaucracy is killing business in Africa", contended that while the socialist economic philosophy has largely been discarded, bureaucracies that have been structured to regulate and control are still in place and are assuming that the private sector is guilty of exploitation until proven innocent (Rauth, 1997, p 12-14). This is in sharp contrast with the East Asian NICs where governments intervened systematically and purposefully, interacting in tandem with businessmen, to enhance economic growth (World Bank, 1993, p 325).

In light of the above conflicting opinions and tidings the "African renaissance" does not appear (at the end of the second millennium) to have a solid foundation for prognostic purposes.

The above narration forms the backdrop to the Black community of South Africa whose African ancestors migrated southwards and confronted the eastward moving descendants of the European colonists, on the Eastern Cape border, during the second half of the eighteenth century. The technological content of their economic life at the time, is, perhaps, oppositely characterised by the aphorism that "they had not yet invented the wheel".

6.2.2 South Africa

In South Africa the politico-historical factors, involved in the entrepreneurial arrearage of the people of African extraction, have their origin in an adversative Black/White relationship arising from a century of hostility and armed conflict, in which the technologically superior forces were the conquerors who assumed political power. Later, the subjugation of the Orange Free State and Transvaal republics by British Imperial forces introduced a complicating factor. Still later, the growing awareness of a probable loss of White self-determination inhering in the growing Black majority occasioned by economic integration (in the Common Area), added a further dimension to the adversative relationship. The marginalisation of the Black population ensued. What was done to them was based on the premise that they were not an integral part of the body politic, but a people (nation) apart with different customs, habits and ways of life. What was done for them emanated from a spirit of paternalism or beneficence or self-interest or a mixture of these motivations, and not as acts of redistribution prompted by claims of the needy on the prosperous by mutual consent, in an otherwise homogeneous society. The Black population was expected to make a contribution to its own economic salvation, in, at least, the regions reserved for them. Successive governments, or opposition parties, after the founding of the Union of South Africa, considered that the advancement of the interests of the poorest section of the White population required priority attention. Differential treatment in favour of Whites was the outcome.

It can be legitimately hypothesised that policy would have been significantly different in some aspects, at least after 1970, had the Black population been a less fertile, slower-growing minority, posing no or little threat to Whites' job security and self-determination and no undue pressure on the fiscus.

The Nationalist government which came to power in 1948, and known for its pursuit of the apartheid policy, was responsible for enshrining in legislation (White) socio-political conventions and traditions of long standing, to lend substance to a parody of a legal principle: apartheid must not only be practised but be seen to be practised. Numerous laws of an economic nature were promulgated to give effect to a policy based on the following tenets: no White employee to be displaced by a Black worker; Black and White workers of equal occupational rank not to operate side by side; no Black person to be engaged in a position which accords him the prerogative of seniority over White workers; Blacks would be able to exercise their economic, social and political democracy only in the areas reserved for them (the Homelands) and not in the Common Area where they were accorded the status of sojourners. Speaking in the House of Assembly in 1956 the then Minister of Native Affairs (HF Verwoerd) pithily summarised government policy: "In terms of the government's plan for South Africa there was no place for the Bantu in the European community above the level of certain forms of labour. Within their own areas, however, all doors were open" (Horrell, 1968, p 5). In his 1961 London speech he asserted that "the government's policy is not based on people being inferior but being different" (Landman, 1968, p 82).

However, given the state of under-development of these "own areas", the open doors did not, in practice, mean substantial opportunities in the non-agricultural private sector for the nurturing of entrepreneurial potential. The crux of the matter was depicted by a pioneering industrial psychologist as follows: "As long as it insisted that all capital, initiative and know-how in the industrial development of those areas must come from Africans themselves, nothing much will happen, resources are just not there ... White entrepreneurial skills would have to be supplied for some time to come ..." (Biesheuvel, 1963, p 28). But Verwoerd was not prepared to permit such supply inside the Homelands' borders, the recommendations of the Tomlinson Commission notwithstanding. A late principal of the Natal University maintained that "the rate of acculturation of the Bantu (that is, in acquiring the skills of Western civilisation) varies in proportion to the frequency of his association with the Whites" (Malherbe, 1969, p 6). And, since the work situation was the most influential instrument in South African society, the policy of separation impaired the instrument. It was only by participating in situations where the appropriate values and attributes of mind were functioning could Africans be expected to assimilate them (Biesheuvel, 1963, p 25).

The policy signified that in the Common Area, where just more than one-half of the Black population was domiciled, their vertical mobility – while not proscribed in toto – was

officially curbed, and occurred primarily as the by-product of the upward movement of Whites in the skill and professional hierarchies in the process of which vacancies were created, opening up opportunities for other groups. This eventuated on a considerable scale in the private sector before the economy entered upon its long-term stagnation phase. Inhabitants of the Common Area could also have made use of opportunities offering in the civil service of the Homelands, but might have been deterred by the low esteem in which they held the traditionalists in those regions who were regarded as collaborators with the regime. In any case, they desired the enjoyment of human dignity in, and the economic treasure of, the more developed areas of the country where they were living.

Many of the specific stipulations of the discriminatory laws – among which the Job Reservation Act probably acquired the maximum notoriety, though effecting fewer than 3 per cent of the labour force and honoured more in the (officially sanctioned) breach than in the observance – could not be enforced as a matter of practical economies. That the quotas involved were in conflict with the ethnic composition of labour supply was repeatedly brought to the attention of the government. And so, during the boom phase of the Kondratieff, the damage to the public image of government policy was more obvious than its deleterious effect on Black employment and occupational promotion. This is borne out by the magnitudes in Table 6.1, which express the growth of the number of persons employed, in each skill category, as multiples of the growth in the respective aggregate (all categories) numbers of Blacks and Whites employed.

TABLE 6.1
GROWTH OF EMPLOYED NUMBERS PER SKILL CATEGORY AS MULTIPLES OF GROWTH IN THE AGGREGATES: 1960-1980

	Blacks	**Whites**
Teachers	2,11	1,52
White Collar:		
I Executive	2,74	1,35
II Professional Technical	2,00	1,84
III Semi-skilled	1,56	1,05
IV Unskilled	1,31	0,77
Blue Collar:		
II Skilled	8,20	0,83
III Semi-skilled	1,02	0,62
IV Unskilled	0,78	0,11
Aggregate	1,00	1,00

Source: Adapted from Department of Manpower Utilisation, 1953 to 1981.

It is seen that Blacks, far from stagnating in occupational ranking, have registered greater advancement in the higher skill categories than Whites. Whatever appropriate weights are assigned to the various categories, the outcomes reveal relatively greater progress for Blacks on the skill ladder during the period 1960 to 1980. These results do not, of course, void the assertion that the second component of the educational process, viz. learning-by-doing, was not given a free rein, nominally and in the letter of the law, to allow Blacks *unhindered* opportunities to rise in the professional hierarchies for the assumption of the entrepreneurial function. But they do suggest that much of the legislation in the economic arena was in the nature of political rhetoric, calculated to send a message to White workers and the electorate that – as it used to be phrased by Cabinet Ministers – "the government cared for them".

With regard to the first component of the educational process – formal primary, secondary and tertiary education – the controversial Bantu Education Act of 1953 held sway. Its proclaimed aims denoted it as an ingredient in the design of Grand Apartheid, or Separate Development, which latter was destined to materialise in the Homelands. In 1953 Verwoerd declared that "education must train and teach people in accordance with their opportunities in life ... Education should, thus, stand with both feet in the Reserves, and have its roots in the spirit and being of a Bantu Society" (Union of South Africa, Hansard, 1953, col. 3585). In 1959 the Minister of Bantu Education reiterated that "the basic principle of Black Education in general ... is to keep the Bantu child a Bantu child ... [who] will not want to become an imitator" (Union of South Africa, Hansard, 1959, cols. 8318/9). His department was resolute that the development of the Blacks and their Homelands had to be rooted in their own cultural institutions and customs, taking into account their right to self-determination which meant that their schools and the products of their schools had to lead the Bantu nation(s) to independence and self-reliance (Republic of South Africa, 1966, p 1). The objective of the separate universities established for them was to "form Bantu men and women of culture", which could only be realised, it was contended in "a university which is intimately woven into the fabric of the community which it serves" (Van Dyk, 1966, p 8). "Developing along their own lines" was a frequently used phrase. The Apartheid government was responsible for increasing the number of universities catering for Blacks, in particular, from 1 to 8, while a variety of institutions for technical and vocational education and training was provided. Between 1984 and 1994 the number of Black students enrolled at South African universities increased from 36 684 to 148 817, or by 15 per cent per annum compared to 4,8 per cent per annum in the case of Coloured and Indian students, and 1,1 per cent in the case of Whites

(Edusource Data News, 1996, p 19).

The formal contents of the educational programmes were, by all appearances, not in dispute. A critical evaluation of the system affirmed that "the syllabuses for primary schools appear to be educationally sound, and, one is glad to know, have been revised in accordance with modern approaches and methods" (Horrell, 1968, p 150), while the syllabi for the junior and senior certificates conformed to those followed in schools for White children. Also, mother tongue instruction and adaptation of curricula to a community's social and economic conditions accorded with received pedagogical principles, as endorsed at an African education conference in 1968 sponsored by UNESCO and the Organisation of African Unity (p 138). A writer who condemned Bantu Education was nevertheless persuaded that the use of a language of instruction other than that rooted in a community's traditions "is demonstrably biased against the poor ..." (Serageldin, 1994, p 23).

However, research undertaken for a master's degree led its author to the conclusion that the syllabi did not allow of an adequate acquaintance with economic life; and there was "little or no motivation for the acceptance of the entrepreneurial role" (Van Zyl, 1970, p 238). He also found that the prescribed Economics curriculum for standards IX and X (now grades 11 and 12) had not been taught at any school for Black children (p 234).

It would appear that the resistance to Bantu Education arose from the image projected by the differentiation inhering in the Bantu Education Act, as a separate enactment, which was perceived as just another weapon in the armoury of the Apartheid system. Leaders of the Black community, who pointed out that "social realities demanded the assimilation of Africans of Western values and techniques" were convinced "by long and bitter experience ... that differentiation would, for them, mean the provision of inferior facilities. Among very large numbers the term 'Bantu Education' became opprobrious" (Horrell, 1968, p 136). And the Task Force on Education of the Signatory Association, who attended a conference on Black education came away equally convinced "that while Apartheid remains in education, it seems inevitable that Black suspicion and rejection of the System will continue" (1988, p 3). At this conference parents, teachers and pupils were urged to register their rejection by means of boycotts of classes, stay-aways and public demonstrations and to "equip people for the liberation struggle".

At a conference on Culture and Development in Africa held at the World Bank in 1992, one

speaker maintained that the Black Education Act fortified apartheid (Klitgaard, 1994, p 108) while another averred that while the Act read like "a liberal call for cultural sensitivity ... it was in fact an instrument for the perpetuation of apartheid – the separateness and subjugation of the Black peoples of South Africa ..." (Serageldin, 1994, p 23). The opinions of these two authors would no doubt have echoed the sentiments of the Act's detractors in South Africa.

In sum, rather than its substance, it was the shadow cast by the political system in which Bantu Education operated that elicited rejection and resistance, often erupting in violence in the revolutionary spirit of 'liberation before education'. Arising from their political struggles the minds of pupils and teachers alike were focused upon matters other than education and preparation for life. The result was generations of non-educated school children, which was most unlikely to constitute a breeding ground for entrepreneurship.

The educational system can also be judged by way of recourse to some statistical indicators. A simple comparison of government expenditure per pupil by ethnic group (see Chapter 12 on government) would suggest the presence of relative inferiority. In so far as the differences in this respect relate to the provision of physical facilities – telephones, laboratories, libraries, water and electricity supplies, toilets and school buildings – the inference will be justified (Education Foundation, 1997, pp 1-4). It is seemingly also justified when regard is had to the larger number of pupils each Black teacher had to handle than his/her counterparts in schools of the other three ethnic groups.

For many years after the Nationalist Government had taken office the White/Black ratio of expenditure per pupil moved around 10:1, but dropped to 5,6:1 in 1984 and was down to 3,05 by 1994. This arose from the fact that the government, having inherited the problem of large numbers of Black children of school-going age not attending school, embarked on a programme of mass education. In 1948 there were some 2 825 000 Black school-age children (aged 6-19), but only 692 000, or 24,5 per cent were enrolled at school (adapted from Horrell, 1968, p 147). The enrolment expanded by 5,8 per cent per annum during the period 1948-1991 (Education Foundation 1994), which was twice the rate (2,84 per cent per annum) at which the school-age population had been increasing, to raise the level of enrolment to 84,5 per cent in 1995, or 8 102 000 out of 9 592 000. If the Black school-age population had increased at the rate of the White school children – given the number of teachers employed – the pupil/teacher (P/T) ratio of the former in 1991 would have been 25,1:1 compared to 20,2:1 for Whites, and in 1994 20,2 versus 19,7. And if this had been accompanied by the same

repeater proportions as those of Whites, their P/T ratio would even have been lower than that of the latter.

The new (post 1994) government discovered that it had to grapple with the same problem as its predecessor, viz. the pressure of sheer numbers on fiscal capacity. And so, instead of reducing the P/T ratios appertaining to Black pupils to those of White or Indian or Coloured children, the ratios – permitted for fiscal purposes – for the latter groups were raised to equal those obtaining among the former. If P/T ratios are a significant determinant of educational quality this policy represented retrogradation. The low P/T-ratio, (old-model C) schools had been portrayed as 'islands of privilege' by the new government; but they had also been islands of excellence, or, at least, achievement, as measured by scholastic success, and therefore, more likely to have produced the type of human material accessory to the generation of entrepreneurs.

It is conceivable that the handicap arising from the provision of physical facilities and the P/T ratios could have been countervailed, to some extent if not in full, by major efforts on the part of teachers and pupils. A government can impose conditions that impede the delivery of quality education, but it cannot decree that it must be inferior. The quality is yet determined by the behaviour of teachers subject to constraints – if such there be – inflicted by pupils. Moreover, there is some international evidence indicating school performance levels not to be sensitive to P/T ratios ranging between 25:1 and 40:1, to classroom-teacher ratios and even to teacher qualifications (Khumalo & Wright, 1997, p 165; Education Foundation, 1993, p 4).

As it was, the programme of mass education, exacerbated by the large annual additions to the school population, necessitated also a mass production of teachers. Since the gestation period of cohorts of prospective well-qualified teachers – through academic studies and years of experience – is quite long, a chronic backlog of supply of such manpower was well-nigh inevitable. Table 6.2 permits us to compare the qualification levels of Black and White teachers, as in 1994.

TABLE 6.2

TEACHERS BY RANK AND QUALIFICATIONS (PERCENTAGES) 1994

	Principal	Dep. Principal	Head of Dept.	Teacher
Unqualified:				
Black	9%	2%	1%	11%
White	0%	0%	0%	0%
Underqualified:				
Black	54%	40%	47%	33%
White	0%	0%	0%	0%
Qualified:				
Black	38%	58%	52%	56%
White	100%	100%	100%	100%
Total:				
Black	100%	100%	100%	100%
White	100%	100%	100%	100%

Source: Education Foundation, 1995, p 18.

The data in Table 6.2 bears testimony to, in comparative terms, an academically ill-equipped body of Black teachers, the fully qualified among them marginally above 50 per cent. Even so, the 1994 situation reflects a considerable improvement over that of preceding years. A more serious failing on the part of a section of this body, however, is an apparent lack of commitment or sense of vocation. Adjured (or intimidated) over a period of decades to participate in active opposition to the government, not required to discharge their duties regularly because their pupils were out on the streets or demonstrating inside and outside the classrooms, and demoralised by frequent burglaries and vandalising of their school buildings (Ngcai, 1997, p 8), habits of mind inimical to professional discipline have been engendered. Unprofessional conduct included absenteeism, arriving late and leaving early, attending community events and doing private work during working hours, leaving their classrooms to visit shebeens (some of which are operated within the school grounds), etc. (Makhari, 1995, p 17; Maree, 1996, p 10; Chisholm & Valley, 1996; SA Institute of Race Relations, 1996/7, pp 198-200). After the new government had taken office in 1994 the academic registrar of Fort Hare University wrote that while the previous government had treated teachers with disdain, "teachers themselves have played a role in demeaning the status of their profession ... leaving schools during working hours to frequent neighbouring shebeens" and stooping to sexual harassment (Pityana, 1994, p 10). In 1997 the Finance Minister censured teachers for arriving late under the influence of liquor and leaving classes early to visit shebeens (Gumede & Ngcai, 1997, p 1). And in 1998 the (then) deputy-President (Thabo Mbeki) enjoined the SA Democratic Teachers Union to expel from its ranks those members found drunk during school hours (Argus Correspondent, 1998, p 4).

It remains a moot question whether teachers, if they so wished, could have prevailed against the tide of violent protests by pupils and students against the authorities under the banner of the slogan 'liberation before education'. Pityana, cited above, while lauding students for their sacrifices in challenging the system, added that "a culture of intolerance, violence and disregard for authority was nurtured", giving rise to a naïve belief that "they can unilaterally dismiss teachers, dictate passes, the curriculum and teaching methods (1994, p 10). The 1992 Annual Report of the Department of Education and Training, recording a loss of more than 11 000 000 pupil-days and 217 instances of robbery, murder, rape, arson, vandalism and fighting in school grounds, declared that "the spirit of rebellion, disruption and, eventually anarchy, which has been nurtured in Soweto since 1976, has led to the collapse of education in Johannesburg". Omotoso called the slogan "one of the most unfortunate to have been produced by the liberation struggle ... Unfortunately, even those pupils who are supposed to be at school now, in the transitional period, spend their time toyi-toyi-ing, neither liberating themselves nor being educated" (1994, pp 138/9).

Generations of school children, particularly after the 1976 school uprising, grew up without having been subjected to mental discipline (and probably other forms of discipline as well). It has been generally conceded that the regeneration of a culture of learning proved to be a very difficult endeavour. The results are reflected in the standards of scholastic performance. The drop-out rate was high: a mixed 1983-1984 cohort technique revealed that out of a cohort of 1000 Black pupils starting their school career 413 would have survived to standard 6 (now grade 8) – which evidenced some improvement on the 1973 situation when the figure was 273 – and only 80 would eventually have passed their standard 10 examinations. A continuation of the historical course would have raised the standard 6 survival rate to 524 and the successful standard 10 number to 123. This latter figure compares with 243, 626 and 719 in the case of Coloureds, Asians and Whites respectively (Sadie, Dostal & Vergnani, 1985, p 6). Standardising for age structure it is found that differential grade survivorship accounted for 70 per cent of the Black/White difference in primary/secondary school enrolment which means that large numbers did not avail themselves of the opportunities offered. It is not possible to quantify the role of each of the following three probable determinants of the differential: (i) the poverty of parents; (ii) indifference towards education, and (iii) 'liberation before education'. But the third factor could be held responsible for any deterioration that occurred after the middle eighties (see Chapter 12).

Of the Black candidates who sat the standard 10 examinations in 1993 only 39 per cent passed, compared to 86 per cent, 93 per cent and 95 per cent in the case of Coloured, Indian and White candidates respectively (Education Foundation, 1994, No 5, p 7). And there is some indirect evidence that the situation had not improved during the following four years: It is also their wont to fight shy of mathematics and science, the study of which, according to Malherbe, would cultivate "respect for hard demonstrable facts ... to counteract his love for arguing in the realm of subjective opinion and his predilection for talkie-talkie subjects ..." (1969, p 10). Of the Black candidates who entered for the standard 10 examinations in 1994, 27 per cent wrote mathematics and 7 per cent passed. The comparable figures for physical science were 15 per cent and 7 per cent (Education Foundation, 1995, pp 13-14). And "few student teachers emerging from the system", according to a Danish sponsored research report, "could be regarded as either mathematically or scientifically literate" (Education Foundation, 1997, p 3).

In the above mise-en-scene there is little evidence of a pursuit of excellence or any other attribute that would conduce to entrepreneurship. A keystone in the foundation for the genesis of substantial numbers of entrepreneurs is lacking.

6.3 CULTURAL FACTORS

6.3.1 The nature and significance of culture

The cultural factors to be discussed are included in the broad definition of 'culture' emanating from a UNESCO sponsored conference held in Mexico City in 1982: "The whole complex of distinctive spiritual, material, intellectual and emotional features that characterise a society or social group. It includes not only arts and letters, but also modes of life, the fundamental rights of human beings, value systems, traditions and beliefs (Jaycox, 1994, p 3). This definition is concordant with the 'institutions' posited by the older generation of institutional economists as the driving force in economic change and which, according to a reviewer of the economic literature on 'evolutionary theorising about economic change' referred to "the complex of socially learned and shared values, norms, beliefs, meanings, symbols, customs and standards that delineated the range of expected and accepted behaviour in a particular context" (Nelson, 1995, p 80; See also Roll, 1938, pp 446-455). In our discussion below those constituents of culture, included in the definitions above, are addressed, which are hypothesised to be promotive of, alternatively inimical to, entrepreneurship, business enterprise and economic development.

The significance attached to the role of culture in particular by Africans, comes to light in the following pronouncements. At the 1992 World Bank sponsored conference on Culture and Development in Africa – where there was consensus about the significance – one of the speakers who had written extensively on the topic, contended that the important question was not whether culture mattered, but how it was to be taken into account for the purposes of development, to which end we would need "a new wave of applied cultural studies" (Klitgaard, 1994, p 102). He cited a Cameroonian, Kabou (1991) who maintained that "African culture and mentalities are the main obstacles to development, yet they never appear on the 'long list of official causes of underdevelopment' ... Africans must understand the depth of their underdevelopment which is not a matter of capital or resources, but 'inside the heads of Africans'" (p 81). At the same conference Etounga-Manguellé asserted that "the answer to our question: Does Africa need a cultural adjustment programme? is 'Yes'" (1994, p 223). Mjoli, writing on the role of the psychologist, claimed that the main cause of the poverty and underdevelopment characteristic of most Black areas in South Africa "lies in some cultural factors which militate against creativity, productivity and the like" (1987, p 17). An associate professor of English at the university of Venda, Ramogale, believes that "a nation's psycho-cultural wealth determines its success ... the failure of African countries ... is evidence that current value systems are flawed ... Africa's mortal enemy lies within ... South Africa may also be profoundly blighted by the same scourge" (1998, pp 13-14). Macozoma, managing director of Transnet, is reported to have said that "Black South Africans needed to undergo a cultural transformation if they wished to influence the economic transformation of the country in any meaningful way" (Business Report, 1996, p 13).

All those statements had but one import: culture does matter. They underscore the pronouncement by the architect of Singapore's economic miracle, president Lee Kuan Yen, that "culture is everything" (Muller, 1994, p 16).

It is to be understood that the discourse below is cast in the image of Western civilisation. This does in no way imply that it is unique as a seedbed of economic development. The economically successful East Asian countries drew their inspiration from "indigenous traditions such as Confucianism and candidly reject Western ideals of individualism, human rights and democracy" (World Press Review, 1994, p 50). But born and bred in a society of Western origin, the author cannot claim sufficient personal experience of, and concomitantly insight into, these other civilisations to permit of definitive judgements of their import in

economic behaviour. Furthermore, South Africa's economic development is a creature of Western (or Christian/Judean) traditions, which represent the alternative way of life to which Africans, including South African Blacks, have been exposed. Since the latter's culture is best appreciated and portrayed by members of their own community, these members have to be deferred to as much as possible for assessments of their cultural traits which may have a bearing on the generation of business enterprise.

The enquiry, it should be stressed, is only concerned with the economic quality of populations as shaped by values, beliefs, norms, etc. and not with other (admirable or not) qualities that may inhere in these same characteristics.

Before proceeding, however, allowance has to be made for the fact that man is a product of both his/her genes and his/her culture, or heredity an environment or nature and nurture. Even while the two forces may be intertwined in the physical make-up of individuals, a portrayal of the duality must admit to the probability of individuals breaching the constraints of an economically thwarting cultural environment to achieve that which a beneficent social environment would have nurtured. The latter smoothes the way for prospective entrepreneurs, and treading it entails or requires no breachings. *Ceteris paribus*, relatively larger numbers will emerge. In South Africa there is still the duality involved in the acculturation process incidental to the transition, consequent upon migration, from traditionalist life in rural areas – already noted in Chapter 5 – to the culture of towns and cities. How much of the customs, norms, beliefs, etc. of the former persist in the new life, and for how long, are moot questions. The emancipated mind may yet be accompanied by a subconscious which harbours traditional mores.

While one can endorse Nelson's statements about the "still primitive state of our ability to work with cultural evolutionary theories" and about "the limits of the power of economics or social science theory more generally to comprehend a set of processes as complex as those behind economic growth as we have known it" (1995, pp 83/4), there remains a need for an attempt to impart some content to the 'how' of cultural influences in the supply of enterprise. To this end the discourse below is linked to a profile of an entrepreneur, constructed on a greatest likelihood basis, as delineated by the attributes which he exhibits or is most likely to display. The attributes are considered *ad seriatim*.

6.3.2 Profile of an entrepreneur

6.3.2.1 *The spirit of Enterprise*

Concomitantly with the definition of the entrepreneur, the spirit of enterprise will be his major characteristic. The supply of enterprise and "entrepreneurship" are interchangeable terms. It subsumes initiative, drive, resourcefulness, courage, a sense of purpose, commitment, dedication, creativity, perseverance and an energetic pursuit of objectives. It implies an adventurous disposition, and a willingness to accept challenges in which obstacles are there to be overcome. Such spirit does not adapt to circumstances, but overcomes circumstances, or, better still, creates circumstances which would provide the realisation of objectives.

Risk-taking is an integral part of this attribute, which is calculated action based on a probabalist assessment of the chances of success and their dimensions in terms of returns to investment. Assumption of risks bears testimony to self-confidence and self-reliance, coupled with the acceptance of individual responsibility and accountability. It contrasts with the dependency cast of mind. It is the converse of the 'indipe' syndrome, about which Dr Ntatho Motlana, founder of the Soweto-based Get Ahead Foundation has this to say: "Our people are developing the indipe syndrome - the word 'indipe' is the Nguni for 'give me' which signifies having a begging bowl in one's hand. Our people seem to have the attribute of holding out a begging bowl and believing that this will serve them for life. Making money is frowned on - and this means we are getting away from the work ethic" (1991, p 20). In a subsequent interview he adjured Blacks "to drop the begging bowl, set on their feet and start working with their hands" (Betty, 1993, p 3). Qwelane wrote: " ... as Blacks we must also abandon our dependence mentality for it is servile and destructive" (1995, p 19). Biko, the (late) intellectual exponent of the Black Consciousness Movement, which had to 'conscientise' Black people to an appreciation of their situation and develop self-reliance, contended that the political oppression, to which the Black community had been subjected, eroded its soul to the extent that they could not conceive of a realistic alternative, thus creating an inferiority complex and a dependency mood (Lötter, 1992). An optimistic note, on the other hand, has been struck by the statement of a one-time academic and later chairman of the Development Bank of Southern Africa, the Independent Development Trust and Black Management Forum, Professor Nkhulu: "We can actually rescue the country. I believe that the dependency syndrome in this country is not that deep, and it can be reversed. I do not believe that we are going to be paralysed by the dependency syndrome" (Wilhelm, 1993, p 8).

This syndrome is reflected in an economic policy document of the ANC (1992) in which massive redistribution programmes were envisaged, the premise being that human rights imply the – apparently unconditional – satisfaction of every conceivable need: housing, electricity, land, health care, a job, education, comprehensive social security, social services, a living wage, etc. These rights are not linked to personal effort, reward for exertion or merit, or whether the community at large can afford them. Included is the assertion that a human rights charter should ensure to all people a minimum of enforceable and increasing entitlements (perhaps more appropriately identified as arrogations). There is no reference to personal responsibility for the satisfaction of human needs – to which there is no limit – in a world characterised by scarcity of economic resources. It extends the meaning of an inalienable human right – that to which the individual can lay claim because of his being a member of the human race without any *quid pro quo* on his part – to encompass that which must be acquired, produced, earned through the expending of human effort by somebody else. The document, moreover, promised the introduction – actualised immediately after the 1994 election – of affirmative action in all areas of the economy, which appeared to be intended not only as compensation for discrimination suffered in the past, but, in addition, as an arrogation – confirming operation. The policies espoused by the SA Communist Party partner in the ANC/COSATU/SACP government alliance could be interpreted as an expression of utmost concern for the welfare of 'the worker' or common man, but may also be viewed as a denial of entrepreneurial initiative on the part of the individual, and an endorsement of the dependency spirit.

The above approach can bear comparison with that of the (White) Afrikaner community when informed by the 1932 Carnegie Commission on the Poor White problem that it had a one-fifth component of poor Whites living in miserable conditions, partly induced by a 60 per cent destruction of Transvaal and Orange Free State agricultural wealth resulting from the scorched earth policy of the British army during the Anglo-Boer war as a means of subjugating the Boer republics. In view of this poverty and the absence of its members from urban economic activity in a capacity other than that of employee, the community considered itself underdeveloped and economically backward, its contribution in the entrepreneurial function outside the agricultural sector measured by a meagre 6 per cent of the GDP generated in the secondary and tertiary sectors of the economy, compared to a 56 per cent share in the aggregate White population number (Sadie, 1967, 1979). From the Ekonomiese Volkskongres of 1939, convened because of the great concern about the welfare of the poor Whites, radiated the clarion call: "A nation rescue itself! Not the government but all able members of society,

acting in unison, had to pursue with vigour, determination and perseverance, the upliftment of the poverty-stricken masses. To this end the Afrikaner community, traditionally an agrarian population, had to conquer the urban industrial world by way of assuming the critical function of the entrepreneur to create employment and wealth." Various institutions were established to act in a supportive role and to foster a purposeful consciousness of the Afrikaners' economic arrearage and the path of self-reliance to be followed to surmount it.

This campaign contributed greatly to the emergence of entrepreneurs among the Afrikaans community to raise their share in the GDP generated in the private secondary and tertiary sectors of the South African economy to some 23-24 per cent from the 6 per cent level at the beginning of the Second World War. The share is larger when government-initiated commercial enterprise is credited to this group. The increase is substantially reduced (but the absolute contribution to the aggregate GDP raised) when agriculture is included (where the Afrikaner is, and has been, the preponderant element) because of the relative waning of that sector in the national economy.

The efforts of some individual Black businessmen such as Dr Motlana (Get Ahead Foundation), S Alexander (Strive Foundation), the executives of FABCOS (Foundation of African Business and Consumer Services), and the BMF (Black Management Forum founded in 1976) appear to partake of the flavour of the Afrikaners' self-reliant, self-empowerment campaign.

However, the great strides made in Black economic empowerment during the 1990's were not self-reliant-based. They resulted from the transfer, on generous terms, of existing production assets engendered by White business men, to Black leaders. By the end of 1996, according to the deputy-president, this accorded Black control over, and/or participation in, companies quoted on the Johannesburg Stock Exchange with a market capitalisation of R115 500 million, representing 9 to 10 per cent of the JSE's total market capitalisation at the time (Sadie, 1998, p 43). (It took Afrikaners more than three decades after 1938 to achieve that level of representation). With its National Empowerment Fund the new government is lending its support to the process by founding a Unit Trust for Black investors, who would also be entitled to loans at low interest rates for investment in the shares of privatised public corporations – apparently at below market prices in some instances – or private sector companies (Swart, 1998, p 15). This is backed up by politicians' pronouncements which radiate the character of moral pressure being brought to bear upon White business to intensify

the empowerment process. Proclaimed Mandela at the 1997 National Congress of the ANC: "Business success can no longer be measured solely by reference to profits ... unless Black empowerment was accelerated the country faced an enormous social and political explosion" (Dasnois & Mabaso, 1997, p 15).

The newly Black-controlled companies will, of course, provide opportunities for the formation of new entrepreneurial talent, but the transfer in itself did not constitute an addition to the supply of enterprise; that had still to be created. And from the ranks of Black leaders emanated the complaint that the persons involved in the empowerment transactions had always been the same select few. The experience of a Community Project Manager with regard to empowerment at the ground level may also be pertinent to the process at the top level: "... empowerment does not necessarily lead to development. On the contrary, empowerment often leads to empowered apathy ..." (Bell, 1997, p 16).

A moot question is whether or not the moral pressure is a manifestation of more of the dependency spirit at issue.

6.3.2.2 *The Quest for excellence*

With regard to the concept of the quest for excellence, frequently used to incite achievement, it may serve some purpose to affirm the obvious: it does not connote the attainment of a goal called 'excellence' – since the goalposts are presumed to be forever shifting – but in the striving towards such end. It is the process of striving that is the foundation of progress in all spheres of life.

The success sought by the entrepreneur can be measured by levels of profits, and/or growth and size of his/her enterprise, relative importance in the market or personal prestige. Striving to maximise or optimise any of these goals can be considered as tantamount to being in quest of excellence in his sphere of operations. (To those who have an aversion to profits the goals will be interpreted as self-seeking and self-enrichment by nature. However, self-seeking serves here as an antidote to sloth; and after a certain level of affluence – varying among individuals – has been reached, riches as such become a non-desideratum, the marginal rate of substitution of effort for income approaching the infinite level.) Apart from subjecting himself to the discipline demanded by his goal, he will make use of all opportunities, within his means, to gather relevant information and knowledge by, e.g. studying at universities and business schools and attending seminars, special courses and the like.

In a sample survey of chief executives in South Africa it was found that 86 per cent had attained at least one university degree while 14 per cent had a post-graduate qualification (FSA-CONTACT, 1990). It implies that they have been subjected to the two intrinsic processes of education: socialisation and individuation, the former being the function of primary and secondary education which familiarises the youth with conventional wisdom to be accepted by them, while the latter occurs at the tertiary and post-tertiary level where the wisdom is challenged, doubt incited and individualisation and self-creation stimulated. A professor of Humanities at the University of Virginia (USA) is adamant that "it is not, and never will be, the function of lower-level education to challenge the prevailing consensus about what is true. Socialisation has to come before individuation, and education for freedom cannot begin before some constraints have been imposed" (Rorty, 1990, pp 43-44).

These entrepreneurs had accepted the discipline of obeying their teachers, studying and passing examinations to obtain certificates regardless of whether they liked it or not. If they were not dedicated pupils/students, they were obliged to act as if they were. Schools were regarded as institutions of learning, not as venues for undisciplined pupils to challenge authority, give instructions to teachers, attend school when they consented to do so, discover pretexts for exchanging pen and pencils for objects of remonstrance, promote themselves up to the standard where they have to face a genuine examination for purposes of certification, and then refuse to pay for such examination because they knew they were going to lose the fee by reason of inevitable failure, etc. In short, the kind of educational setting pictured in section 6.2.2. The entrepreneurs in our scenario would be products of schools staffed by dedicated teachers with a, or some, sense of vocation. It used to be *infra dig* for these teachers to organise strikes, down their chalk to demonstrate in the streets, or desert their classrooms to join delegations lodging complaints with cabinet ministers. At the tertiary level the prospective business leaders enjoyed the benefits of the individuation process uninterrupted by campus-trashing, lecture room-damaging demonstrators who believed that they were entitled to a university or technikon education without prescribed academic qualifications or the payment of tuition fees.

Passing judgement (in 1998) on the post-1994 government, after it has been in office for 4½ years only, could be considered premature. But during this period policies have been formulated and action taken that do not reflect a quest for excellence in educational, political and economic matters which, according to Ramogale, is entailed in "the concept of the

African renaissance" (1998, p 14).

In its White Paper on Draft Assessment Policy in the General Education and Training Phase (Republic of South Africa, 1998) the government expounded a new approach to the evaluation of a pupil's (now called a learner's) progress and success at school. It is referred to as an outcomes based educational system (curriculum 2005) which "focuses on the achievement of clearly depicted outcomes, rather than teacher input in terms of syllabus content" (par. 4.1). The White Paper likens this outcomes based assessment to driving tests, among others: "If in any particular batch of candidates, if no-one is competent, no-one passes. If all are competent all pass ... This approach contrasts with systems which rely overwhelmingly on norm referencing (in contrast to criterion referencing) where the primary purpose is selection" (par. 4.1). The emphasis is on peer group assessment (par. 5.1). On p 28 the document reads: "It is expected that learners will progress with their age cohort", but in the introductory Draft Policy statements (p 7) it is declared that "learners will progress with their age cohorts". Such statements are reminiscent of the 'pass one pass all' slogan current among demonstrators at one time. It would appear that significant external control over standards of education (examination in traditional terminology) would only be exercised at the end of the period of compulsory school attendance (grade 9)(Cf. Berkhout et.al. 1998; Smit, 1998).

The word 'examination' is assiduously avoided, and so, it would seem, is the selective process which distinguishes between the good, the bad and the indifferent. In this scheme of things individual achievement does not occupy a central position. It has the flavour of contentment with mediocrity. It is reminiscent of a Minister of Sport's insistence that South Africa's participation in international sport must be democratised by selecting teams which have a maximum demographic representation of athletes even when their performance is below par. The goal is participation, not winning. (The Olympic creed, in this regard, refers to participation in an effort to win, and is not an invitation to perform indifferently).

The British experience, where a system similar to Curriculum 2005 has been in vogue since the 1960s, may provide a lesson in this regard. The Economist reported that the progressionism which stressed egalitarianism and learning by discovery is being replaced with a 'new' orthodoxy – vigorously promoted by ministers and their advisors – which "believes in the power of competition and comparison – so, more tests, more league tables and no more 'non-competitive sports days'" (1998, p 42). Learning by being taught is in, learning by discovery is out; mental arithmetic and times-tables are in, calculators are out;

spelling and grammar are in; self-expression is out; etc.

Curriculum 2005 has the appearance of aiming at the production of literate masses who might function satisfactorily as followers, but not as leaders who could form the nucleus for the genesis of entrepreneurs. The quality of human material emerging from the implementation of the system depends heavily on the quality of the teachers, that is, level of qualification and dedication or sense of vocation. The findings in section 6.2.2 above do not inspire confidence in this regard. In the circumstances greater, not lesser, reliance on textbooks would have been indicated. But in practice the opposite is encountered. Government expenditure on textbooks declined from R895 million in 1995/6 to R425 million in 1996/7 and to R170 million in 1997/8; and of the latter still less than 80 per cent reached pupils in the form of textbooks, the remainder having found its way into fraudulent transactions (McCallum, 1998, p 11). The retrenchment of teachers resulting from the raising of the P/T ratios, in concert with the application of affirmative action, entailed a loss of the better qualified teachers and favoured treatment for the lesser qualified in the filling of new vacancies by assigning priority status to period of service. There is a direct correlation between the latter and the degree of no- and under-qualification (Hartshorne, 1996, p 20).

A quest for excellence does not radiate from the following official actions and pronouncements either: The Council for Scientific Research announced in 1997 that to qualify for government bursaries, for the purpose of Honours degree studies, White students should have attained 75 per cent during their undergraduate years while others needed only 60 per cent, and the number available to the latter would be two to three times that of the former (Giliomee, 1997, p 15); the Minister of Health exhorted medical schools to provide for an intake of first year students, preferably from the beginning of 1999, in accordance with the ethnic composition of the population, even while the deans of these institutions described the quotas involved (some 76 per cent to Black students), in the absence of the appropriate student material, as ridiculous (Bot, 1998, p 15; Du Toit, 1997, p 4; 1998, p 4). Ministers reacting to the loss of highly qualified professionals through emigration, thought it was just as well that they left (Karsten, 1998, p 16) and that it might be a blessing in disguise (Coetzee, 1998, p 4). And all the time the proficiency of the civil service and parastatals was being curbed, if not eroded, by affirmative action appointments, while the Employment Equity Bill was posing a similar threat to the private sector. Affirmative Action can, in fact, be considered a repudiation of the principle of meritocracy or, at best, a game of chance in which the odds are stacked against the achievement of eminence.

An important issue is how much of the above 'transformation' is featuring the Africanism or 'Africanness' the new elite is expressing a yearning for, Africanisation being, arguably, the antithesis of westernisation. At a conference convened to search for an African identity, and attended by academics, a coherent philosophy of education was sought as foundation for "a new body of knowledge" steeped in the "forgotten traditions of African scholarship and knowledge". The delegates decried the domination of Whites over cultural and educational resources and considered that Africanisation was a necessity, not a luxury (McMagh, 1996, p 13). The Minister of Education vented the idea that "in Africa you go African – curriculum and all" (Vosloo, 1996, p 19). An African who was in the running for the Witwatersrand University's vice-chancellorship thought that the faculty members who accused him of embellishing his CV were trying to obstruct the Africanisation of the university (Ester, 1996, p 32). The president of the ANC Women's League, Ms Madikizela-Mandela, asseverated that the second revolution – the 1994 change in government was the first – would be characterised by Africanism, African humanism and a pronounced African identity (1998, p 3). And the successor of Mandela (as president of South Africa) affirmed that he is an African (Mbeki, 1998, p 9).

In the evidence above one cannot discover a desire for the rule of meritocracy or a quest for excellence. This attribute, in our profile of an entrepreneur, is not nurtured. If post-1994 election events are indeed representative of Africanness, Africanisation is unlikely to provide a solid foundation for economic development and prosperity, by way of the generation of entrepreneurs.

6.3.2.3 *The Work ethic*

The large majority of South African entrepreneurs manifest an attitude towards work which can be associated with the Christian-Judean work ethic as reflected by adjurations in the Scriptures, and verses extolling the virtues of work such as "go to the ant, sluggard; consider her ways and be wise" (Proverbs 6:6); "whatsoever thy hand findeth to do, do it with all thy might" (Ecclesiastes 5:12); "in all labour there is profit" (Proverbs 14:23); etc. According to Max Weber (1958, p 163) Calvinism, in particular, was conducive to an inner worldly asceticism which made for a propensity toward continual and restless labour. The executives in our profile exhibit a powerful work ethic which means that work has some moral content according gratification beyond the financial benefits involved, so that the balancing of the marginal utility of remuneration against the marginal disutility of effort as a determinant of

hours worked is inoperable. Long hours are the rule. One sample survey found an average of 11½ hours per day (Coetzee, 1985). They become engrossed in their work, preferring it to leisure or carried along by the inexorable demands of their enterprise, to the extent of qualifying as workaholics.

Contrariwise, it is maintained that "labour does not have the same existential and moral values for the Black man as it has for us ... labour mainly consists in supporting nature's willingness to give" (Rauche, 1968, p 164). A German-born theologian observed the following about the Sotho: "Die Arbeit steht im Dienst des Ritus. Sie produziert nicht den Reichtum; sie öffnet nur die Sehlenzen, damit er hereinströmen kann" (Nürnberger, 1987, p 165). Muthwadini writes about his community's world view: "It sometimes happens that a person is very industrious, and works hard in his field ... and because of his hard work God blesses him and he gets a good harvest, far more than his less industrious neighbours. In that case, his neighbours will often be jealous of him and they won't believe that he received this blessing of the good harvest because of his hard work. They will say: he has zombies working for him" (1990, p 3). Another African suggested the existence of "a cargo-cult mentality in which Nigerians believe that one day, without any great effort on their part, all the good things of the world can and will be theirs". And the doctor working in Africa and reporting this, maintained that "in one form or another, this mentality is present throughout Africa" (Daniels, 1987, p 9).

There is, in the environmental determinism tradition, still the argument, to be taken cognisance of, that geography and climate are not to be overlooked as probable determinants. Disparaging the 'so-called' superiority of Europe, Himmelstrand maintained that "the greater European inclination for trade and business ... was a matter of survival due to climatic conditions which made it impossible to grow crops for subsistence all the year round ... whereas in Africa hunting and gathering, and later sedentary agriculture, could supply enough food for most of the time ..." (1994, p 26). While it is true that tropical and sub-tropical climates, with their humid heat, are not conducive to great exertion, the effects can be counteracted by means of modern technology. Again, the experience of some of the NICs during the past few decades does not support a hypothesis which would accord a definitive role to climate or geography in the determination of the work ethic.

6.3.2.4 *Commitment*

A powerful work ethic will be accompanied by commitment, dedication, a sense of duty and the strict observance of the obligations implied in the executive function which can be

considered as one of the obvious 'rules of the game'. (Clock-watching will have as sole purpose punctuality in keeping appointments). It entails a great deal of disutility in the form of long, sometimes irregular, hours of work spending much time in travelling, away from home very often, 'living out of a suitcase', agonising, stress, fatigue, etc. Its acceptance testifies to dedication and self-discipline. In a field survey a researcher found a prevalence of occupational obsession with dire results, as follows: "Die nastrewing van beroepsukses en loopbaanontwikkeling vind met ontstellende ywer en oorgawe ten alle koste in die moderne bydryfsituasie plaas. 'n Ongekende beroepsbeheptheid onder dinamies-kompeterende bestuurslui geskied met so 'n mate van slaafsheid dat die instandhouding van ander primêre verpligtinge (huwelik en gesin) totaal verwaarloos word" (Coetzee, 1985, p 2). The price paid for the assumption of the entrepreneurial function is also echoed in the study of the characteristics and performance of the modern manager by two researchers of the Potchefstroom Graduate School of Business. They found that many South African executives occupy their posts at too youthful an age, do not have the necessary experience or exposure to the demands of the job, are promoted to positions above their level of competence – all of which bears testimony to the scarcity of this kind of manpower in South Africa which is highlighted by the fact that one-third of the numbers involved have been born overseas – and experience a great deal of stress. They also spend most of their time at work, the dedication to which, as a first priority, relegates wives and children to a secondary status (Uys & Coetzee, 1990). The incidence of psychosomatic disorders among them is accordingly higher than average. It attests to conscientiousness.

This is a price – and a seemingly unavoidable one – to be paid for the generation of economic development and growth. There are straws in the wind suggesting a lack of enthusiasm for honouring the rules of the game (the demands of the entrepreneurial function) among Black circles. A leading public relations consultant who attended a Black Management Forum in Johannesburg reports that a female executive - a product of a superior educational institution - could not understand "why in an African country with a black majority, black people had to be the ones to conform to the minority, so-called corporate culture.... She felt it was time that the majority protested strongly against this cultural colonisation, and began to assert African culture in the corporate world." The reporting consultant's illuminating response to this "tirade" (as he called it) is best recorded in his own words: "In the pursuit of profits the corporate world has devised certain ways of doing things, certain norms and regulations that have to be obeyed by all who want to be taken seriously in business. These norms are sometimes referred to as 'corporate culture' and finds expression in ... education and job skills,

certain standards of behaviour such as mature language skills, attention to detail, punctuality, a high degree of social polish, business etiquette and a smart but conservative dress style. It is only by obeying these rules that one can hope to climb up the corporate ladder" (Leoka, 1992).

In the array of disutilities involved in the execution of the entrepreneurial function the above rules are still minor ones. An unwillingness to accept them constitutes a rejection of entrepreneurship. The female executive was echoing the teachings of the late intellectual exponent of the Black Consciousness Movement who resented the domination of Western values, and urged Blacks to rid themselves of the shackles of subservience, to innovate without recourse to these values and "to reduce the triumph of technology over man and the materialistic element that is slowly creeping into our society" (Biko, 1973, p 45). The statement sounds like an articulation of romanticism rather than economic realism. If the features of entrepreneurship recounted above are to be subsumed in the offending values, can there be economic innovation in their absence?

At a conference of the National African Federated Chamber of Commerce and Industry (NAFCOC) in 1990, Black advancement was projected to achieve the following targets by the end of the century: 30 per cent of board members in stock exchange listed companies; ownership of 40 per cent of listed shares; 50 per cent of all services and supplies to large industrial companies; and 60 per cent of all managers to be Black (The Bilateralism Review, 1993, p 38). If one is not to discount the target-setting as wishful thinking or a staking out of an entitlement claim, it does radiate a singular lack of comprehension of the realities of the entrepreneurial/managerial function on the part of businessmen (presumably wised to the demands of modern business) who are members of a community whose LF features a less than one per cent component to execute this function.

Office bearers of the new government often do not act as role models in the manifestation of the sense of duty and conscientiousness expected of executives. Sometimes they do not arrive on time for appointments or do not arrive at all. Africa time (see below) may be involved here. One example, recorded in a scientific journal, reads as follows: A Cabinet Minister accepted an invitation to deliver an address at a symposium on World Environment, long before the event was to take place. "The symposium, however, suffered from a growing annoyance – the no-show by the Minister of Education, professor Bengu. No forewarning, no apologies, no contact whatsoever. The organisers were left with no option but to improvise

..." (Reay, 1997, p 1). This is not an isolated incident. Ministers do not seem to take their obligations to parliament too seriously either. At the end of the 1997 parliamentary session just short of 400 questions put to them in the National Assembly had not been answered (Sawyer, 1997, p 10).

6.3.2.5 *The competitive spirit*

The relevance of competition in the life of the entrepreneur was fittingly formulated by a speaker at the Conference on Culture and Development in Africa: "The entrepreneur is right in the middle of the turbulent stream of competitive individualism, where success comes to those who boldly and skilfully accept the risks – the opportunities – that present themselves there" (Waldavsky, 1994, p 157).

Enterprise entails and requires competition with others who may also be in the market. In the formal sector this invariably takes place in a peaceful manner, at the micro level by way of price, service or product differentiation or, at the macro level by competing for the consumer's or user's Rand (e.g. by advertising), or both. Some of it is of the creative destruction type, in Schumpeterian terms, with the triumph and survival of the more efficient and innovative, pushing the economy to higher levels of progress.

The antithesis is clearly delineated by the following statement by the former president of Zimbabwe: "Our own African way of life, our traditions and our cultural values have always emphasised our interdependence, co-operation and mutual solidarity. The tendency towards individualism and cut-throat competition is foreign to us. We are by upbringing adverse to individual progress and individual advancement at the expense of, and to the detriment of, the other people in the collective" (Anon, 1986, p 36). This pronouncement is affirmed by the following: "Because personal relationships are so important in Africa the ideal man is regarded as a man who can get along well with other people, is not fond of quarrelling, who can compromise, who does not think much of himself, who does not try to compete with other people, and try to be better than they, or to have more than they, also does not try to collect for himself more wealth than other people have ..." (Muthwadini, 1990, p 32).

The absence of the competitive spirit is associated with egalitarianism – one person, one vote, but great disparity in contributions – which entails the problem of the free rider who is more interested in redistribution than economic development. When, as in South Africa, the free riders are in the majority demanding the satisfaction of the human rights and entitlements

(arrogations) mentioned in 6.3.2.1, the economy is not well served. A modest amount of the culture of egalitarianism is indispensable, says Waldavsky, "but a large amount is antithetical to democracy and development ... insistent demands for equality of condition exacerbate racial and ethnic conflict and redistribute resources before they are obtained" (1994, p 155).

The new education policy discussed above does not encourage the spirit of competition, and the taxi violence over a period of many years may serve as a demonstration of intolerance of competition in which rivals are eliminated through market forces (as opposed to the barrel of a gun).

6.3.2.6 *The rational approach*

Since reason is the ultimate authority in decision-making it is inconceivable that the entrepreneur would not manifest the rational approach. It is implicit in the notion that man is master of his own destiny. His decisions are the product of calculated risk and chances of success. He has the enquiring, inquisitive, analytical mind, which objectivises the problems that are regarded as obstacles to be surmounted. A thinker he will undoubtedly be. His thinking would of necessity have to be at least of the linear, or vertical, high probability type in Edward de Bono terminology, but would often involve lateral, low probability, innovative and creative thinking which is not limited by the confines of the high probability conditions of the vertical process, but which, however, serves as complement to it. De Bono calls it "an attitude and a habit of mind" (1978, p 15). In the traditional African *weltanschauung* human kind would be governed by magical forces, beyond the domain of reason, which have to be humoured and not challenged. Subjugation to forces of magic is associated with fatalism: the belief that man can manage neither his needs nor his resources (Waldavsky, 1994, pp 155/6). It is not compatible with development. The emancipatory influences of the urban areas induce the acceptance of science and technology and other exterior appurtenances of modernity but do not necessarily conduce to the predominance of rationalism as defined above: - a condition which has been compared to that of the contextualised identity (Van Niekerk, 1992). Some of the new elite are known to pay obeisance to, and invoke ancestral spirits for, guidance in their decisions. A Commission of Inquiry into witchcraft, violence and ritual murders in the Northern Province of South Africa found that most of the people interviewed still consulted witchdoctors/traditional healers despite missionaries condemnation of such practices (Ralushai Commission Report, 1996, p 48) and that many young people, and students in particular, attributed unexpected illnesses to witchcraft (p 13).

A most tragic outcome of a belief in the irrational, associated with witchcraft, was demonstrated by the Nongqwuase incident in the Eastern Cape of the previous century, when starvation struck the community consequent upon the deliberate destruction of crops and livestock, which was regarded as the condition for the exaltation of Xhosa power and prosperity – like the mythological phoenix rising out of the ashes.

6.3.2.7 *The time dimension*

Business leaders operate as if they comply with Benjamin Franklin's dictum that time is money, and that procrastination is the thief of time. Time is of crucial importance in business and government decisions at both the short and the long-term level. With many decisions, in any enterprise, being taken on a day to day basis, time consciousness obliges the keeping of appointments and arriving at the venues at the appointed hour, completing tasks within specific periods, etc. Non-conformance is considered a dereliction of duty resulting in inefficiency and concomitant economic waste. The observance of 'Africa time' represents such non-conformance.

It is claimed that while the Westerner is task-focused, which means attention to the time constraint, the African is people-centred, the process of human interaction, involved in the discussion around a task, rather than its performance within a specified time, is of prime importance (Scholtz, 1997, p 6). A researcher of the HSRC, enquiring into culture as facilitator in development, reported that in rural and informal settlements "the development process is bogged down by (among others) laborious consultation and negotiation processes ..." (Malan, 1996, p 47).

At the long term level there is need of a vision or time horizon stretching into the future spanning ten, fifteen or longer years – although, it would seem, not too long or the vision may lead to inaction. The initiation and growth of an enterprise, and of the national economy, is a function of investment and capital formation which, by its very nature, is a future-directed activity. It will not be engaged in unless the mental horizon allows of a consideration of the future in concordance with the lifetime of the capital equipment in question. Providing for the future, which does not look after itself, is the growth and development engendering force.

There appears to be consensus that the time concept, as a development-inspiring attribute in traditional African society, is flawed. According to Omotoso "time in true oral cultures has no specific measure. Time is mythical, it is social and it is collective ... Time spent alone in an

oral culture is time that does not exist" (1994, p 120). Time is identified and remembered by out-of-the ordinary events, and not the other way round and, of course, at any moment future events have not yet come to pass. Nürnberger offered this simile "... man mußte sagen daß die Basotho mit dem Rücken zur Zukunft durch die Zeit gehen" (1987, p 152). In similar vein there is Biesheuvel's statement that in traditional African society people "lived in the extended present. The past was far more important than the future for which one made little preparation. Time is something to be enjoyed, not to be one's master or turned into money ... the acceptance by Blacks of Western time habits is far from complete" (1980, p 23). This is also borne out by professor GD Oosthuizen's profound analysis of Africa's social and cultural heritage (1985). And a Kenyan-born professor of Theology has characterised his society as follows: "Since the future does not exists beyond a few months, the future cannot be expected to usher in a golden age or a radically different state of affairs ... African people have no belief in progress, the idea that development of human activities and achievements move from a low to a higher degree. The people neither plan for the distant future nor build castles in the air" (Mbiti, 1969, p 23).

6.3.2.8 *Motivation*

It is hardly possible that an entrepreneur or a prospective entrepreneur, would not to some degree at least, be animated by what the psychologist depicts as the need for achievement (or eta (η) achievement). HA Murray defines it as the desire "to accomplish something difficult. To master, manipulate or organise physical objects, human beings or ideas. To do this as rapidly and as independently as possible. To overcome obstacles and attain a high standard. To excel one's self. To rival and surpass others. To increase self-regard by the successful exercise of talent ... To work with singleness of purpose towards a high and distant goal. To have the determination to win. .... to enjoy competition. To exert willpower ...." (1938, p 164). According to J W Atkinson it is "the capacity to experience pride in accomplishment" (1964, p 214). D C McClelland, in his research about man's inner concerns or motives, found that "chief among these motives was what we called the need for Achievement : a desire to do well, not so much for the sake of social recognition or prestige; but for the sake of an inner feeling of accomplishment ... people who were 'high' in this motive tend to work harder at certain tasks, to learn faster, to do their best work when it counts for the record and not when special incentives such as money prizes are introduced, to choose experts rather than friends as working partners" (1971, p 110). In a later publication he elucidates further: "What should be involved in the Achievement motive is doing something for its own sake, for the intrinsic satisfaction of doing something better" (McClelland, 1987, p 228). According to him an

achievement-oriented ideology is an essential condition for, and a precursor to, economic growth and development.

This characterisation seems to be consistent with the attributes already detailed above in our portrayal of the entrepreneur.

It would appear that though persons with a strong need for affiliation (η Affiliation) could display qualities similar to those high in η Achievement when aroused by appropriate incentives (e.g. where congenial human relations are required), they are unlikely to succeed in the entrepreneurial function. The latter demands unpopular decisions offending people and engendering criticism and unpopularity. Those high in η Affiliation prefer positive, affective relationships with others, avoid conflict and competition and seek social approval. Since people are very important to them they would rather have, and appoint, friends than the best qualified outsiders as working partners. When this is manifested as nepotism in the management of a country's economy - that is, by politicians in power - the outcome is low productivity, corruption and little economic growth, which is a feature, with few exceptions, of economic life in Africa (Leistner, 1989, p 28).

The pronouncements of African leaders quoted in the discussion of the competitive spirit and the spirit of enterprise intimate that the Affiliative motive would be a prominent element in African society. It is reflected in the following description by Muthwadini of his people's attitude: "Even if a man is rich because he has worked hard he will still be expected to share everything that he has with them. And if he does not do it, he will be regarded as an evil man, even as a witch or someone who has zombies working for him. People will be jealous of him" (Muthwadini, 1990, p 33). This passage emphasises a similar point made at an earlier stage of his portrayal, where the character described here was considered miserly, and it was judged that the community preferred everybody to be poor rather than some rich and some poor. The extended family system, a high birth rate, communal land ownership and common grazing fields fit into this picture. They provide some social security but, at the same time, a powerful disincentive to achievement. Achievers are not appreciated and public censure would not allow them to enjoy to the full the fruits of their success. Mazrui maintained that traditional African societies were products of "cultures of nostalgia rather than of anticipation, cultures that move slowly, value prestige instead of achievement ..." (1994, p 80).

The quest for "ubuntu" in South African life – 'a human being is a human being through

human beings' – can be considered a manifestation of the Affiliative motive. In the work place it is to be translated into joint ownership, shared responsibility, joint decision-making, participative management, consultations, democratic values, etc. (Smit, 1998, p 15). It may epitomise humanitarianism, but it also gives the impression that the socially desirable objectives in question have to be pursued, primarily or only for their own sake, not as a means of promoting the efficiency of the production process.

A third motive which may be relevant to the emergence and performance of entrepreneurs is the need for power (η Power) i.e. for self-assertion, and establishing influence or dominance over others. When high η Power is combined with low η Affiliation (not concerned about being liked or not) and high in Activity Inhibition (self-controlled, serving a good cause) we have the leadership motive syndrome (McClelland, 1957, pp 313/4) which will make for managerial success at the stage where, not individual creative striving, but the influencing of others is required.

However, a strong power drive is more likely not to be thus constructively channelled. When it has been socialised (i.e. in the service of fellowmen) "it may become so strong and determined that in the end it overrides sensitivity to whether people are getting hurt", (McClelland, 1987, p 447) with violence ensuing. This imperial power motive syndrome characterises the political kingdomseekers whose η Power has been raised by the stress imposed by the discriminatory measures in South Africa, from a level depicted as "blacks' deeply rooted striving for strength and power. The impulse-controlled personality creates, with the striving for power and strength, a community where the law of the jungle is valid" (Du Preez, 1980, p 3). A Zimbabwean academic would have it that "power, like a desolating pestilence, rages in Africa and the people remain victims". (Hove, 1992, p 19).They appear to act in accordance with the philosophy espoused by the late Ghanaian president Nkhruma who parodied the Biblical verse, implying that all the other good things will be given unto those who inherit the political kingdom. Since political power implies economic power, it is a preferred route to affluence. It is a means of gaining a livelihood, even in luxurious style, without trudging the long and arduous road of economic development. The attractions, moreover, of the status and prestige of strutting the political scene and the opportunities for exercising power are much greater than those of the mundane nitty-gritty of engendering economic growth. Appealing to the emotions, as in political campaigns, is a much simpler exercise, and has a much greater chance of success, than appealing to reason as required by economic growth. Staging a *coup d'Ètat* is an even more direct route to economic comfort

than engaging in elections. And such coups have a tendency of becoming a way of life in which the successful politicians have no, or little, incentive to promote economic development, whose occurrence becomes a fortuitous event. Assaying "Africa's social and cultural heritage", Oosthuizen found "that those people who utilize political power in order to achieve success on a personal level, in fact do not display the qualities essential for economic development ..." (1985, pp 81-82).

If power is to be attained by way of an election, it would appear that scruples are not allowed to stand in the way, judging by the South African experience during the run-up to the 1994 election: The future of the youth is sacrificed by inciting them to demonstrate, to boycott classes, to bundle teachers out of classrooms and by feeding them on a diet of violence. Trade unions are requested to make ridiculous wage demands supported by stay-aways, sit-ins, sleep-ins, down-tools, strikes, often involving violence and damage to property. Mass street processions (rolling mass action) are used to disrupt traffic, economic and social life, and more often than not end in violence and looting. Political rivalry provokes murder and mayhem. International trade and financial sanctions are espoused and foreign capital investment is frightened off, which together with all the preceding forms of action are calculated to wreak maximum damage upon the economy, reduce the national product and increase unemployment, poverty and hunger. It could be argued that the ends justified the means since the actions were inspired by a liberation, in addition to a power, struggle. But it could equally be contended that the conduct in question was uncalled for since the ANC/ COSATU/SACP alliance should have known, at least after January 1990, that victory for them at the polls was a foregone conclusion. Success is on the side of the big battalions. All this is anathema to the entrepreneur who is the antithesis of the political kingdomseeker.

6.3.2.9 *The nurturing environment*

The motivational factor explored above relates to the nature of the individual which could inspire him to achievement regardless of his socio-economic environment. The exponents of the behavioural explanation of human activity, however, emphasise the latter, and would deny that there is need of an enquiry into man's inner concerns or internal state to predict his behaviour, as posited by the above, psychodynamic approach. To them striving behaviour rewarded by societal approbation, and thus reinforced, would be the motive force. According to one exponent "an individual's behaviour patterns are shaped ... after they have been performed ... certain activities judged desirable by a society or group are positively reinforced, others are not and still others may be punished. By positively reinforcing an activity after it

has been performed the probability of repetition is increased, and if such reinforcement is frequent and intermittent the probability approaches certainty" (Kunkel, 1971, pp 133/4). The following conclusion of a group of experts who gathered in Monrovia in 1981 can be considered to be a confirmation of the behaviour model: "The prime objective of development has to be the creation of a material and cultural environment that is conducive to self-fulfilment and creative participation. This implies a break with the past: a break with a number of concepts and habits ... a break with the evil of deceitful slogans and paper-thin achievements in favour of a courageous attempt to tackle the embarrassing facts of life so as to be able to start today to prepare for the future". (Anon, 1981, pp 15/16). This amounts to a plea for a culture of development which will nurture the economic growth of which Africa is in woeful need. A similar inference can be read into the title of a paper: "Economic development is a way of life" (Sadie, 1966).

If causation is uniquely enacted in the behavioural mould it would place the burden of responsibility for a movement out of the 'low economic equilibrium trap' in Africa on change in the cultural environment. However, rather than viewing the psychodynamic and the behavioural approaches as mutually exclusive alternatives, they should be regarded as complementary. One must allow for the transformation of society by the efforts of individuals in the face of unremitting "aversive stimulus". In the Western tradition progress in arts, science, literature, music, business, etc. has been an elitist process; not the creation of the masses. There are individuals to whom success - as judged by themselves, not society - in their economic (or other) endeavours is reward enough, regardless of society's reinforcing approval or disapprobation. Accordingly, one must allow for deviants emerging from a traditionalist society inspired only by their own motivation, to assume the innovating - in our case the entrepreneurial - function and conditioning the community to an acquiescence or acceptance of the benevolence of their actions, or forming small islands in a sea of conformist inertia. The cultural environment will then not determine whether achievers will emerge or not, but how numerous they will be by reason of its being supportive or, conversely, inhibiting. A crucial question surfaces: can a spirit of enterprise be successfully grafted onto African culture? At the Conference on Culture and Development in Africa some optimistic notes were struck. Klitgaard cited an author, Buijsrogge (1989),whose experience in the rural areas of West Africa led him to the conclusion that it "destroys the theory which affirms that the obstacle to development resides precisely in these structures and values of traditions" (1994, p 78). Salim (Secretary-General, OAU) maintained that Japan's performance clearly demonstrated that traditional cultural values and modernism were compatible (1994, p 12).

Dia, too, thought that it would be necessary to build on the local traditional values as in Japan and other Asian communities (1994, p 190). This inevitably raises the question whether the values of Japan (or East Asia) and Africa are comparable in the context of nurture. The second question is how the 'building on', or 'adaptation to', is to be accomplished. According to Bryant cultural congruency could be achieved by means of "management approaches to strongly held local norms and practices ..." (1994, p 447); while UNESCO also preferred the suggestion that action in this regard should be "along lines similar to those indicated for management development" (1994, pp 546/7). To another speaker, Etounga-Manguellé, chief executive officer of a company (SADEC) which conducts seminars on cultural adjustment, this implied 'deconstruction' as a first step "that is, to recognise that African cultures sometimes do influence negatively the economic performance" (1994, p 219).

The management approach can be interpreted as the provision of the learning-by-doing educational and training facilities for the generation of entrepreneurs. But it still begs the question: where do the managers of the prospective managers (or trainees) hail from if not from non-indigenous sources? The nurturing factor at issue relates in the first place to the executives not the trainees.

It could be argued that the analysis above does not have predictive value for the performance of the Black community of South Africa. While their contribution to the entrepreneurial class is relatively small – 3,7 per cent compared to a 70 per cent share in the aggregate labour force, the relevant magnitudes for the Indian community being 4,3 per cent and 2,8 per cent, and for Whites 89,7 per cent and 17,3 per cent respectively – it has been achieved despite a contrived inhospitable climate. During the decades before 1986 there were, in the Common Area, restrictions on the founding and expanding of business enterprises by Black business men, while White managers have been accused of a lack of enthusiasm for training Blacks lest they become competitors. In addition there has been, according to an influential Black manager, "above all a reluctance – due to political pressures – of Blacks to move into management positions because it was seen as part of the capitalist system" (Ncube, 1993, p 23). And in the self-governing and autonomous regions indigenous entrepreneurship did not make impressive strides. Also to be borne in mind is that many of the antitheses instanced above, to highlight the typical attributes of the entrepreneur, referred to traditionalist societies which, in their mindsets and values, could differ significantly from the urbanised communities. Even so, it would seem that the development of a new way of life, generated endogenously within the mould of the culture of cities – which is conducive to a secularisation or emancipation

process, freeing men and women from the fetters of tradition and conformance – is neither a simple nor a speedy operation. "Even where urban life leads to the rejection of traditional religion and the adoption of secular values, it is found that the world-view remains, and continues to influence thinking" according to Oosthuizen (1985, p 81).

When a spokesman of a Black Teachers Union declares in public that they did not want White teachers – who are much better qualified – in their schools, because they did not want a foreign culture imposed upon their schoolchildren, does it reflect a purely pedagogical principle, or an unwillingness – in the words of the Monrovian experts cited above – "to break with a number of concepts and habits ... with the evil of deceitful slogans and paper thin achievements ..." (Africa Guide, 1981, p 16).

In summary, but for the argument that by the end of the millennium not enough time had yet been allowed for a true gestation period, the response to the crucial question posed above cannot breathe unstinting optimism.

6.4 SOME SPECIFIC DEMOGRAPHIC FORCES

6.4.1 A quantified portrayal of the population's economic quality

The cultural attributes dealt with in 6.3 can be regarded as constituents of the economic quality of the population, representing, that is, its potential as a source of economic growth and development. We can, however, also proffer a quantified portrayal of such quality, determined in part by demographic factors, by having recourse to the skill composition of the labour force, in which the entrepreneur features as the kingpin.

The quantification of the economic contents of the human material is carried out by constructing population categories by socio-economic class, around the male members of the labour force according to the skill content of their occupations, as recorded by the Central Statistical Service in their Manpower Surveys. To this end the differential fertility, mortality, and age and occupational structures of the four ethnic groups have been employed (Sadie, 1991, pp 128-130). (Female members were omitted because the large majority are married to husbands who have a higher occupational status, and their inclusion would frustrate the exercise.) Four classes or categories have been distinguished:

I The entrepreneurial/managerial/executive class.

II The professional and technical group together with other white and blue collar skilled workers.

III The Semi-skilled.

IV The unskilled and underemployed.

The unemployed have been assigned to classes III and IV only, the labour force members with standard 8 or better school certificates having been regarded as members of the semi-skilled male workers around whom Class III has been assembled.

For purposes of comparison and judgement a similar exercise was carried out for the USA on the assumption that the relationship between labour force per skill and total population per class would be similar to those obtained in South Africa. Although the result for the USA is no more than an approximation, it is contended that any error arising from our assumption would not be significant enough to render the comparison invalid.

The outcome of the analysis is summarised in Table 6.3 and graphically portrayed in figures 6.1 and 6.2 in which the numbers in Class I are set equal to 1 and those in the others are expressed as a ratio to the size of I.

TABLE 6.3
SOCIO-ECONOMIC CLASS STRUCTURES

	S A POPULATION						USA
	1991-96	1991	2011 Without upward Mobility		2011 With Mobility		Population structure
	TFR	Structure	Structure	Growth % p.a.	Structure	Growth % p.a.	
I	1,8	1,0	1,0	0,6	1,0	1,0	1,0
II	2,3	3,8	4,2	1,1	5,1	2,4	2,4
III	3,1	13,5	16,9	1,8	16,4	2,0	4,8
IV	4,2	17,5	23,1	2,0	19,5	1,5	1,9
	3,6	35,8	45,2	1,8	42,0	1,8	10,1

The economic problèmatique of South Africa, representative of the category of semi-industrialized countries, is vividly exposed when its economic (or socio-economic) class structure is compared with that of the United States, representative of highly developed countries. In the former, class I has a numerical status of 1 in 35,8 or, if it is considered that I

and II together constitute the condition for the welfare of III and IV, the status is 1 in 7,5, according to the 1991 situation. Juxtaposing the American situation of 1 in 10, and 1 in 3 respectively, and postulating that an approximation to the American population quality is required for reasonable rates of growth, development, employment, and thus of high or reasonable living standards, the economic weakness of the South African population is starkly portrayed. Figure 6.1 permits us to appreciate the huge superstructure resting and dependent upon the slender formation of class I or I and II.

The data in Table 6.3 testify to the customary inverse correlation between class status and fertility (and growth), that is, between the ability to create life and the capability to sustain it, those with the least capability having the largest families. If a positive correlation between performance in intelligence or similar tests and socio-economic status is truly representative of differential mental ability, genetically transmitted from parents to children, the differential fertility and growth would spell an inevitable decline in the average quality of the population. This is represented in the 2011 class structure according to the hypothesis of no upward mobility, where the numerical status of class I now becomes 1 in 45,2, or, of classes I & II, 1 in 8,7. However, we are reminded by geneticists that what is transmitted is not a phenotypic attribute but a genotypic potential for the developmental response of an organism to its environment (Birch & Gussow, 1979, Ch II) which may be hospitable or inhospitable. A rapidly expanding economy, generating many opportunities for advancement, would constitute a hospitable environment. It is generally conceded that the I.Q. does not necessarily measure the talent and personality qualities which can, or need be applied in occupations; that it could evidence the effect of education which higher class parents can afford better than the lower class ones; that it can reflect differences in motivation to perform well in the tests; that these latter are not necessarily culturally unbiased; and that they do not make allowance for the probability that the official discriminatory measures against the advancement of the Black component of classes III and IV might have denied full opportunity for the development or expression of innate ability.

Figure 6.1

SOUTH AFRICAN 1991 POPULATION BY CLASS

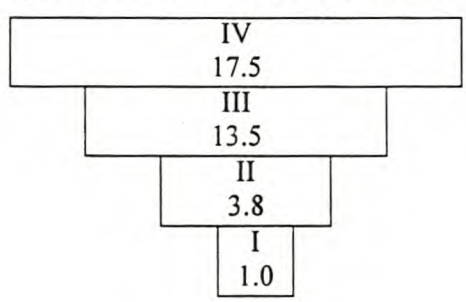
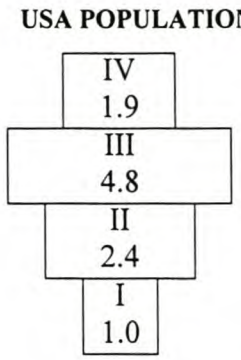


Figure 6.2



As it is, the class structure of the South African population has exhibited upward mobility over time and, accordingly, an historic improvement in the average quality partly as a function of the level of economic activity. It was greatest during the golden era of the Kondratieff cycle, slowed down from the middle of the eighties by reason of the large majority of new accretions to the labour force having swollen the ranks of the untrained, unemployed and underemployed. If, for the purposes of projection, we ignore the period of stagnation and accord the 1975-85 period a one-third greater significance in occupational progress on the preceding ten years (part of the golden era), the resulting upward mobility of the population will produce a faster growth for classes II and III than for the other two, as shown under the year 2011 in Table 6.3. In the event, the numerical status of class I is still lower than in 1991, even while I and II combined now yields a 1 to 6,9 ratio, compared to 1 to 7,5 for 1991. The source of economic growth is most likely to decline in numerical strength. The White population (projected natural increase 0,3 per cent p.a.) which (for whatever reason) has been the predominant (89 per cent) supplier of entrepreneurship, and must for practical reasons be expected to continue doing so for the foreseeable future, will have a share of only 2,4 per cent in the total LF increment during the 20 years (1991-2011), compared to 15 per cent during 1960-90.

To test for the possible mobility-inhibiting effect of discrimination against Blacks, who form the vast majority of classes III and IV, their actual LF achievements over the period 1946 - 1985 have been compared to what they would have been, (the norm), had Black numbers in each of skill categories I, II and III grown at the rates registered by the White LF multiplied by the ratio in which the aggregate Black LF growth exceeded that of Whites. The comparison, whose outcome is not, of course, definitive in unconditional sense, reveals a considerably better actual performance than the hypothesised norm. This was to be expected in the light of the information in Table 6.1. The outcome is a manifestation of the

entrepreneurial dynamism of the discriminators which, until the beginning of the eighties, was potent enough to counteract the restraining effect of the discriminatory measures for the most part, in that the Whites, in whose interest they were applied, and whose numbers were augmented at a decelerating rate, moved rapidly upward leaving vacancies to be filled. The experience of the years after 1986 would intimate that the dismantling of discrimination is no substitute for entrepreneurial dynamism.

However, specifically in the case of the managerial cadre, apartheid, defined as legalised discrimination, would have impeded the advancement of larger numbers into the senior level by reason of their marginalisation arising from the group area restrictions. It has been maintained that the Black managers were "poised in psychological uncertainty in no-man's land between the White-dominated middle class managerial world and the black working class in their company and in the Black Townships". (Watts, 1986, p 6). Functioning in the White society during the day, they were not allowed to continue normal contact, after working hours, with the environment in which the business norms, values, standards and world view are nurtured, and they were not fully accepted in their residential environment either. In the workplace itself Black managers also had (have) to contend with the process of social closure, in which White managers wanted to optimise their own rewards by denying or limiting access to opportunities to those not considered eligible. And eligibility was conditioned by perceptions that Blacks lacked the necessary abilities and characteristics for upward mobility. (Human & Icely, 1987, pp 20/22; Franks, 1987, p 32). This negative attitude has the air of stereotyping and/or prejudice, but unfortunately the research does not include an assessment of the verisimilitude of these perceptions.

During the hey-day of apartheid a Nuffield Research Fellow who studied the careers of a Reeftown Black elite reported as follows: "... our educated elite felt wounded by all the small pinpricks received in even the most benevolent interracial contact. But in their careers, our elite had encountered only a few setbacks because of colour. On the contrary, their colour had rather favoured their careers. In reality, and the truth should for once be told, separate development gave them opportunities which they might not otherwise have had." (Brandel-Syrier, 1971, p 290).

The conclusion must be that the evidence available does not permit of a definitive inference about the influence of pre-1990 policy. We shall be traversing some firmer ground when assessing the effect of specific demographic impulses on the economic quality of the South

African population.

6.4.2 The home environment

It would appear, judging at least by experience abroad, that in the absence of genetic differentials, social barriers and overt discrimination, the tendency towards closed-group or intra-class reproduction, i.e. class-inertia, will remain. Sons are more likely than not to enter the occupation of their fathers or one close enough in rank order and, accordingly, the childrens' advancement is linked with their parents' class (Brown, 1979, pp 189, 206, 233, 251). Even with a high incidence of superior ability among children of manual workers, they were "unlikely to move out of the social class into which they were born" (Douglas, Ross, Simpson, 1968, p 100). This is featured in the sub-title of a book, *How working class kids get working class jobs* (Willis, 1977). When samples of 13 year-olds and standard 6 pupils in South Africa were subjected to a General Scholastic Aptitude Test (a test of academic intelligence) it was found that a large part of the variance in scores could be explained by socio-economic status, compared to attitudinal and motivational variables (Claassen & Schepers,1990, pp 300/1). The crucial element is the style of upbringing in the home. Parents will not be transmitting to their children knowledge, habits of mind, values, notions about the value of education, verbal expression, ambitions, interest and aptitudes which they themselves do not treasure. Again, children are likely to internalise the expectations of their parents. In a study which related the IQ of twelve-year old Scottish children to family background factors including family income and size, parents' education and living space, it was found that "much the highest correlation was with parental encouragement. But only those parents who feel it is within their power to achieve goals that they set before themselves are likely to set goals before their children that they encourage them to achieve. Parents with low incomes are more likely to feel themselves helpless in the grip of circumstance". (Phelps Brown, 1979, p 221, quoting Fraser 1959). When negative correlations between intelligence and size of family emerge from research (Douglas, 1967, pp 124-5) causality can be traced back largely to parental encouragement, or the lack of it, or style of upbringing, which can be subsumed under the environment or nurture. The effect of the environment on the growth of intelligence is more pronounced when it is unfavourable than when it is favourable.

6.4.3 Reproduction, nutrition and health

Nurture can be said to start in the intra-uterine environment of the foetus which is essentially a parasite living on the nutrients in the mother's body. Appropriate nourishment, particularly proteins and the vitamin B complex, is required for the proper development of the child's

central nervous system upon which intellectual activity is dependent. Severe malnutrition and vitamin or hormone deficiency cause injury to this system which cannot be undone by improved nourishment at a later stage (President's Council, 1984, p 120). The Neuro-psychological Research Unit, Unisa, found that "mild to moderate under-nutrition is likely to have a permanent effect on brain function and development". (Centre for Science Development Bulletin, 1992). A New Zealand study of the lives, from birth to adulthood, of more than 1 000 babies born during 1972-73 found that low birth weight in full-term babies had an adverse effect upon intellectual growth. The research group's measures of temperament at age 3 had powerful predictive value for behaviour up to adulthood. (However, they concluded that the children of working women were not relatively disadvantaged). (Louisson, 1994, p 6). Nutritional requirements for good health, vitality and mental development continue after birth, of course, but is particularly important during the first two post-natal years. In the high fertility community, frequent pregnancies following closely upon one another, the short intervals may render it impossible for mothers to reconstitute adequate reserves of nutrients, resulting not only in children lacking in economic potential but also in mothers whose health does not allow of the competent rearing of her children. "One cannot place too much emphasis on the close relationship between the health of the mother and the health of the entire family", proclaims the United Nations Department of International Economic and Social Affairs (1987, p 69). In the case of physically immature teenagers the competition between foetus and mother for nutrients is greatest, while physiologically and psychologically they may be less capable of coping with the exigencies of pregnancy, childbirth and subsequent upbringing of the child. If they become pregnant while still at school, it will mean the interruption or termination of the school career and the abandonment of occupational aspirations. If they are married there is a greater likelihood (than for marriages at a higher age) of the marriage ending in divorce with adverse consequences for the children.

The Demographic and Health Surveys (DHS) and the World Fertility Surveys (WFS) have brought to light that the excess risk of death before age 5 arising from poorly spaced births can range from 35 per cent to 123 per cent, (Hobcraft, 1991, p 24; Palloni, 1991, pp 25/26), reflecting the differential health and nutritional status, and concomitantly the economic potential, of survivors (Behrens, 1991, pp 36, 38). Using well-spaced births to mothers aged 20 to 34 as reference category, the DHS's and WFS's also showed up an excess risk of 46 per cent for first births to mothers younger than 20. The absolute number of births per mother can also be detrimental to the health of the infant, the risks increasing steeply after the third.

These elements in the reproductive process which exacerbate the risks of child mortality also reduce the chances of survival of the mother, depriving the surviving children of a mother's care, with very serious results for their development. According to the Senior Population Adviser to the World Bank the reason for the high rate of maternal mortality in Africa is "that many women are having children without being properly nourished themselves. Sometimes they start too early. They may be spacing children too closely. Sometimes they are going on for far too long, when they are too old to have children safely ... women who start having children before they are 18 years of age are risking their lives drastically. ... Compared to the risks faced by their sisters in Europe and America the African mother faces risks a hundred or two hundred times greater" (Sai, 1991, p 4).

The above life-impairing (length and quality)conditions of the reproductive process apply to most of the South African population in class IV and some in class III. The incidence of teenage motherhood of high-fertility class IV is 2,9 times that of class I (Mostert, Van Tonder, Hofmeyr, 1988, p 86), the probability of continuing motherhood after age 35 is 6,6 times as high; the average number of births 2,4 times that of class I, the probability of a first child being born to a single parent is some 8 times as high. In a study of 3 000 children born in Soweto over a six-week period during 1990, it was found that 50 per cent of the pregnancies had been unwanted, causing stress and demoralisation among most mothers, many of them without financial and moral support from the fathers (Centre for Social Development, 1991, p 14). This portends a most inauspicious start to life.

The prevalence of malnutrition among children 6 to 9 years old in South Africa can be juxtaposed. Using as conservative measure 75 per cent of the NCHS (National Centre for Health Statistics) Standards of weight for age, it was found that 2 per cent of White, 14 per cent of Black, 21 per cent of Coloured and 25 per cent of Asian children, in a sample of 20 000 schoolchildren, fell below this reference level (Vergnani, 1983, p 9). The differences between the last three percentages must be a function of feeding habits or knowledge of the preservation of life, since the economic factor would have produced a converse result. An additional acceptable explanation would be that the sample did not contain adequate representation of Black children since large percentages of them were not attending school and three of the four autonomous states, viz. Transkei, Bophuthatswana and Venda, had not been included. If stunting (a height for age measure), which is an adaptive response to chronic under-nutrition, is not closely correlated with mortality, data on its incidence will provide valuable information for the assessment of health. Such data are not available for South Africa

except for the results obtained by Operation Hunger in measuring 401 children in 28 rural villages which showed a 56,5 per cent incidence of a stunted condition. With an average per capita income approximately one-sixth of the national figure these children are not, however, representative of South Africa in the aggregate. The Committee on Value Added Tax (VATCOM) estimated that some 2,3 million South Africans needed nutritional support for the combating of malnutrition (VATCOM, 1991, p 15), which are approximately half-a-million more than are actually given life-supporting supplementary food by Operation Hunger. In neighbouring countries (around 1980-90) the percentage for children 2 to 5 years old is reported to be 23 in Lesotho, 31 in Zimbabwe and 51 in Botswana (those whose height for age is less than 77 per cent of the medium) (Haldenwang, 1993, p 44/5). The available daily supply of calories per capita of the total population of these same countries in 1988 was 2307, 2232 and 2269 respectively, while that of Namibia was 1889 and of Mozambique 1632 (United Nations Development Programme, 1992, pp 150/3). The 3 035 calories average for South Africa may mask a fairly wide dispersion of individual intakes, some of which will no doubt not qualify as adequate.

The probable meaning of these calorific values for the economic quality of human lives can be gauged by comparing them with the following estimated requirements of a labour force for a 100 per cent working capacity in various sectors of the economy: White collar service industries 2 400, secondary industry 3 000, Agriculture 3 600 and Mining 4 200. (Correa, 1963, pp 36/7). The statistics quoted above, particularly when the probable deviations around the means are taken into consideration, must point to under-nutrition on an extensive scale and/or large numbers of workers operating below optimum productive capacity. Children's progress as they grow into adulthood will be impeded by their being defective repositories of learning, knowledge and training by reason of their apathy and lack of interest. And they will not be able to summon up the enthusiasm which, according to Walter Chrysler, "is at the bottom of all progress. With it there is accomplishment. Without it there are only alibis" (Ibid). Good health is necessary for the child to respond actively to the stimulation he receives in the educational process.

6.4.4 Malnutrition, poverty and family size

Since malnutrition is closely associated with poverty, the question arises to what extent the latter can be traced back to demographic factors. While this matter in its broader context is argued in a later Chapter, we can here demonstrate the effect of fertility, net of mortality, on the amount of economic resources available for the nurture of the child and, thus, on its

economic potential. This amount will be equated with the marginal cost of children in a representative low-income household living in Johannesburg whose male breadwinner earns the Household Subsistence level income of R930 per month. The marginal cost calculation involves debiting rental and transport costs to the parents only. The details at issue are as follows: (Institute for Planning Research, 1993, p 33).

Primary cost (Rand)		
Father	134	
Mother	116	
Rental & Transport	157	
General expenses	30	
		437
Boy 15-18	132	
Girl 11-14	113	
Child 7-10	94	
Child 4- 6	82	
Child 1- 3	64	
General expenses	69	545
Available to children	493	(= 930 - 437)

The difference between the amount available to children and the total cost of the five children detailed above is due to the fact that the average number per sample household is taken as four and not five, and the age composition of these children need not necessarily equal that in our example. To the above statistics we can now apply the following data on comparative age structures, viz.:

	Class I	**Class IV**
Fathers	100	100
Mothers	100	100
Children (0-14)	69	147

Assuming that the breadwinners' income per month is R930 for both classes of households, the application yields an average amount available per child of R335 for Class IV compared to R714 for Class I, a disadvantage of 53 per cent. This latter statistic becomes 60 per cent when the Black population is compared to the White population, and 64 per cent when the figure is calculated on a family headship and child dependency basis. In terms of the latter it can be maintained that if the Class I child has to compete with one sibling for the economic resources of his father, the Class IV child has to contend with three to four. Alternatively,

with the expenditure on education of a given amount per family the former class will face a pupil/teacher ratio more than twice that of the latter, entailing a concomitant education of lesser quality. If the former would want to compensate for the disadvantage by way of the mother's entry into the labour force - assuming she could earn the same wage as the father - some 69 per cent of those in the economically active ages would have to do so (compared to a 100 per cent non-participation for Class I mothers). In the event, the attention devoted to the rearing of the children will be reduced.

In practice, the usual adjustment to the deficient economic condition, pointed up above, is the early termination of school attendance, not only to reduce costs to parents but also to allow early entry into the labour force to augment the family income. But this implies the forfeiture of human capital formation, condemning the victims to low status, low income, jobs to perpetuate poverty.

Even while reference to the culture of poverty is best avoided because of the implication that it reinforces dysfunctional behaviour which exacerbates poverty (refuted by empirical research, according to Bryant (1994, p 450)), it does not imply that chronic poverty – in the life of successive generations, that is – does not constitute a most unpromising environment for the attainment of an achieving society with high upward mobility to produce relatively large numbers of entrepreneurs. Children in communities thus afflicted would seem to be mentally and psychologically incapable to benefit from education. They have been prepared for failure, not success, leave school as soon as possible, and are doomed to remain in unskilled jobs for the whole of their lives in the course of which non-attendance and absconding are regular occurrences. Reproductive prolificity ensures the perpetuation of the vicious circle of poverty begetting poverty and economic stagnation.

6.4.5 The crucial age

The authors of *The Origins of Human Competence* define unequivocally the crucial age in the process of human development. "After 20 years of research on the origins of human competence" they attest, "we are convinced that much that shapes the final product takes place during the first few years of life" (White, Kaban & Attanucci, 1979, p 183). This is repeatedly emphasised in preceding paragraphs e.g. "To get to the heart of the matter, it appears that a first-rate educational experience during the first 3 years of life is required if a person is to develop to his or her full potential ... poor progress during the early years seems to be remarkably difficult to overcome" (p 181). The right time to begin the stimulation of

intellectual curiosity and the structuring of experiences as an aid to child development is not later than 7 months, when the kinetic-mobility of the infant is increasing and he/she begins to show an interest in the object world around him/her, such action to extend over the critical period 7 to 36 months (p 37). Again, "we have become convinced that the experiences of the period of life between 7 months and 3 years are of unique importance" (p 117). Still more, "It is our belief that the experiences children have between the seventh and twenty-fourth month's of life are of especial importance for the lifelong development process" (p 138). In another study of the course of development of attributes such as general intelligence, intellectuality, achievement at school, etc. it was concluded that "their is a negatively accelerated curve of development which reaches its midpoint before age 5 (Bloom, 1964, p 214). Similar conclusions were drawn by other researchers (Taylor, 1983; President's Council, 1984, pp 117/119; Biesheuvel, 1978, pp 120 *et seq)*.

That there are a number of countries whose political leaders or educationists underwrite the above findings emerged at a Montreal conference on how to identify and educate an elite (The Daily News, 1981, p 6). The outstanding example was Venezuela, whose Minister for the Development of Intelligence (Machado) compared theories with de Bono - who developed the concept of lateral thinking (1978) and insisted that intelligence was not sufficient but that the skills of thinking had to be taught - and initiated `intelligence programmes' adapted from de Bono's theories which included the encouragement of mothers in maternity wards to stimulate their babies' senses soon after birth (Silber, 1992, pp 24-28). In South Africa the Human Sciences Research Council's Early Education Unit developed the "Toybox" as an enrichment package for pre-school children to stimulate social and cognitive competence, the application of which had a positive effect on the psychometric competence of two- and four-year old children (Kemp, 1993, p 26-27).

It needs to be added that there may be some scepticism about the definitive importance of the youthful age in the generation of the achievement motive in so far as a major exponent of the latter, McClelland, in his later years, initiated short term programmes to raise the level of achievement of mature participants (Weiner, 1980, p 220). On the other hand, it would appear that parents who are not permissive about sexual and aggressive assertiveness, and who discipline their children, could inhibit the development of η Power in their children, (a negative force) and thus put a damper on the emergence of an attribute which is inimical to managerial success (a positive outcome) (McClelland, 1978, pp 325, 326, 456).

Given then, that the first three to five years of life are of critical importance, the childrearing practices during these years, apart from those factors already mentioned before, should have a major influence on its development as a source of eventual economic growth and development. The upbringing involves the stimulus (or lack of it) imparted by parents by way of the interest they manifest in the child's activities, learning process, awareness and intellectual curiosity, and the amount of encouragement provided. Using rich, well-structured language containing abstract and general terms in communicating with the child, and enunciating reasons and explanations, will equip him/her with a better tool of problem solving, and an understanding of the world around him/her. Mere gestures and commands will not be conducive to the attainment of such goals. According to White, Kaban and Attanucci "it is not so much what an adult can do, but what the adult does do that makes the difference" (1979, p 179).

They also found a remarkable degree of superiority in the early intellectual development of first-born children compared to those born later, parents (in their study) having spent twice as much time with the former and have probably been observing greater sensitivity in their responses, with a more open-minded approach to childrearing (pp 123, 177, 179). Understandably, when pregnancies follow one another in rapid succession, practices and means other than regular communication and attention - such as confinement to playpens - will be devised to deal with children previously born, who would most likely be left, to a great extent, to their own devices. A study of outstanding achievers and very gifted children in New York disclosed that they "were all more likely to be only children, oldest children, or children with longer than average distance between themselves and the next older child, than could be explained by chance" (Lipset and Bendix, 1959, p 222). It needs no great imagination to realise that the mother of a large number of children, as in class IV and III, cannot lavish care upon each of them with the same amount of enthusiasm, zeal and energy as she would on one or two. Phelps Brown, commenting on 33 surveys which have shown negative correlations between size of family and children's intelligence, remarked that "the mother of a numerous brood is remarkable if she is not overburdened and sometimes overwrought, unable even if she had the time to give her children the emotional support they need ... the major factor common to large families in all classes seems likely to have been the reduction in the interest and encouragement that each child can get as the number of children grows" (1977, p 222).

6.5 CONCLUSION

Since the ethno-demographic composition of the South African population, in concomitance with differential rates of growth, is in itself a source of economic change, the net of relevance in the discussion above has been cast rather widely, to include a variety of characteristics and experiences which can affect the economy by way of the composition in question. However, it would be presumptuous to try and quantify the relative significance of demographic forces in the process of economic development, via the economic quality of the population and entrepreneurship, in comparison with other factors such as economic status (not demographically determined), intelligence, knowledge, values and norms of the parents. When a culture of economic development is wholly lacking, demographic factors will still be important, but only at a secondary level of causation, exacerbating retrogression (high fertility, rapid increase) or, in the opposite, containing it. In our appraisal we shall exclude such lack and assume that the above factors of a non-demographic nature will not preclude the emergence of economic growth generators, even if not necessarily promoting it actively. We can then offer the following compendium of the handicaps - arising from demographic conditions only - suffered by a child (a male to obviate the necessity of repeating his/her) born to parents in class IV compared to one born to class I (or even I & II) parents, in a possible quest to move upward in the class hierarchy to reach the entrepreneurial/managerial/executive status. His likelihood

- of being born to parents in an agrarian society, where the culture of the city, emancipatory of traditional inertia, has not penetrated, is five times as high;
- of being the result of an unwanted pregnancy, six or more times as high;
- of being born into a (demographically induced) poverty condition, more than twice as high;
- of being born to a teenage mother, two-and-a-half times;
- of being born to a single parent, 2,9 times;
- of receiving the necessary stimulus and encouragement during the first three years of rapid development potential, one-half to one-third;
- of competing with siblings for the economic resources of his father, three times;
- of suffering from malnutrition and consequential lack of interest in the learning process, and of ambition, three times;
- of leaving school before attaining a proper foundation for occupational advancement, three times (in practice, with the addition of all non-

demographic influences, it becomes six times);

- of finding a job in a stationary economy, one-third that of class I.

Children being born and growing up in the environment depicted above are most unlikely to be invested with the characteristics attributable to the entrepreneur: the spirit of enterprise, initiative, drive, commitment, perseverance, an energetic pursuit of goals, a spirit of independence, a strong work ethic, a competitive spirit, a strong awareness of the necessity of providing for the future, dedication to learning, and a powerful achievement motivation. They are more likely to stagnate on the lowest rungs of the occupational ladder, reproducing children in a vicious circle of economically deficient human material perpetuating itself. When the adult victims of the above conditions move into urban areas where their children can observe the contrast between their economic situation and that of the more affluent, chances are that these children become revolutionary material imbued with a strong power motive syndrome, eager to attain some economic well-being by means of violent political action, rather than of self-exertion in economic activity.

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CHAPTER 7

NATURAL RESOURCES

7.1 POPULATION AND NATURAL RESOURCE CONSUMPTION

We can identify the following components of natural resources: natural beauty of the landscape, climate and wildlife – which can form the basis for profitable tourism; mineral resources, which are non-renewable; renewable plant life (trees, forests, shrubs); air; water; land. Constituent elements of the ecosystem, as they are, they are interlinked, so that damage to any one of them (which shall be called consumption i.e. use without restoration) will impact upon all the others. Consumption of natural resources by way of pollution and degradation of nature, air (atmosphere), water and land, deforestation and the mining of mineral resources, reduces their quality and/or quantity to render economic development unsustainable at a given level and compromise the ability of a next generation to satisfy its needs (inducing intergenerational inequity).

Without implying the conferment of a specific relative significance to the demographic factor in the causal process, it can be stated that mankind, harnessing natural resources to the satisfaction of its needs, cannot but impact upon them.

In enquiring into the pressure of mankind on its natural resources, or (encompassing all of them) the physical environment, we can relate the consumption (C) in question to the following factors as possible determinants of its level.

N = Population numbers (including composition and growth)

Y = Income per capita, the affluence factor, which in the history of economic development is so highly correlated with technology employed so far that it can be subsumed under Y. This does not exclude the possibility of developing alternative technology to produce an existing level of affluence. The distribution of income within and between communities (Ydistr) is, of course, relevant.

P = Price, which can stand for the outcome of market forces and/or public policy.

In short, C = f[N, Y, P, Ydistr]

This specification of the relationship reminds us that the demographic factor is not necessarily

the only or the most significant cause of pressure on natural resources in all instances. In the conclusion the relationship will be subjected to further analysis.

7.2 NON-RENEWABLE RESOURCES

By their very nature exhaustible resources are irretrievably lost when they are used, and cannot be restored. One example will suffice: it took nature some one million years to produce an amount of fossil fuel that the world uses in one year. An oil field once depleted will not be regenerated within the next few thousand years, if ever. In the case of precious stones and metals, bought for adornment and investment, the loss is largely confined to the raw material producers, and does not necessarily extend to the world at large. To the former their durability is indeed a cause for concern, arguing that it accumulates an overhang of supply in the market which is not conducive to price and income stability. The exhaustion of deposits of these minerals and metals, though important from the point of view of the population of producing countries, will not have quite the same damaging effect on the world economy as that of some other forms of non-renewable resources. To South Africa, as an important producer of these and other non-fuel minerals the depletion of deposits is a living standard-impairing process. Its production of gold, for example, diminished from 910 tons in 1972 to 493 tons in 1997 and around 460 tons in 1998 (based on nine months' production as recorded by the Department of Minerals and Energy, 1998). This metal earned 26 per cent of foreign exchange on current account of the balance of payments during the period 1980 to 1997, starting with a 45 per cent share when the price had skyrocketed to 800 dollars per ounce, and ending on 15 per cent (SARB Quarterly Bulleting, various issues). The exhaustion of the richest ore compelled the industry to mine progressively lower grades and this, in combination with increasing wages and other cost items, raised the average cost of production per ounce in South Africa to the highest in the world. Between 1987 and 1998 the number of jobs in the gold-mining industry declined by 283 400 (CSS P0242, 1987 and 1998), affecting the lives of more than a million persons. The industry's contribution to government revenue from taxes on income and profits shrunk to 0,6 per cent in 1997, down from 14,6 per cent in 1985.

In terms of the number and quantities of other minerals found in South Africa the country can be called mineral-rich (which does not thereby qualify it as a rich country). The foreign exchange earned by them exceeded that of gold by R6700 million in 1998 and the excess is increasing every year. In 1998 they were responsible for just over 16 per cent of the balance of payments current account earnings. Some of the non-gold minerals are strategic materials of which South Africa has major portions of the world's reserves (Vanadium 45%, Chrome ore 68%, Manganese 81%, platinum group metals 56%), with platinum benefiting from environmental degradation in that it is used in catalysts for the reduction of car exhaust emissions (Chamber of Mines, 1997, p 4). They accorded the country a degree of bargaining

power during the years of stockpiling by some industrialised countries, and propped up the economy while manufacturing was declining and moving sideways in its contribution to the GDP ever since 1981. But this dependence of the economy makes for vulnerability in light of the depletion of reserves or, at least, of the higher grades of mineral deposits. When the income-, matrix- and (what can be called) the "foreign exchange" multiplier of the mining industry are taken into account its contribution to the welfare of the population is not adequately reflected by its 1997 7,8 per cent share in the generation of the GDP (SARB, September 1998, p 5-106). And the consumption of "nature's capital" involved in this process is tantamount to living on the community's capital instead of only the `interest' on the capital.

The rest of the world behaves in similar fashion with potentially dire consequences for the reserves available to future generations. As is to be expected, the rates of consumption are positively related to the level of industrialisation, in cross-sectional country analyses. Were current rates to be maintained, reserves of copper, for example, would have a life span of 277 years, at zero population growth. The projected 2030 world population, however, consuming at the rate of the United States - which implies sizeable increases in those of the less developed countries (LDCs) - will reduce the life span to 26 years. In the case of platinum the reduction would be from 400 to 40 years (Frosch & Gallopoulas, 1989, p 149). The influence of the affluence factor emerges from the following figures: During the thirty-seven years, 1950 - 1987, copper production increased by one-and-a-half times the rate of the world's population growth, steel almost two times, and aluminium five times (Population Reports, 1992 May, p 19). Industrialised countries containing 20 per cent of the world's population are consuming 80 per cent of iron and steel and 86 per cent of aluminium production. By 1989 the USA was using up virgin raw materials at a rate seventeen times that of 1900, while its population has risen just more than three times (Population and the Planet, 1995, pp 10-11).

Since a modern economy is run on energy, the Report to the Club of Rome, *The Limits to Growth* (Meadows, *et al.*), in 1972, followed by the raising of oil prices by the OPEC cartel, sparked great concern about the availability of future supplies of the sources of commercial (i.e. non-traditional) energy. In the responses elicited there was reference to the profligate use of resources at accelerating rates, "cowboy economy", rape of the earth, etc., even while mathematicians and economists demonstrated the sensitivity of the predictive model in the Report to changes in parameters and assumptions. Since 1972 there has been a decline in the rate of increase in *per capita* commercial energy use, to show a rise of only 13 per cent during 1970 - 1990, from 2,04 to 2,30 kilowatts, compared to a 100 per cent increase during the preceding twenty year period, which, in turn, was preceded by a 231 per cent rise. It would seem that over time, the course of energy consumption, presented in stylised form as a function of the tempo of economic growth, traces out a sigmoid curve (a flattened S-curve). The highly industrialised countries have reached the tertiary stage represented by the levelling off of the curve, while the LDCs are moving along the secondary stage of acceleration of

consumption intensity in which the elasticity of demand with respect to economic growth is higher than 1 (Holdren, 1990, pp 109-115; IFR, 1993, p 5-68).

At the time of writing the First World, affluence that is, was still responsible for the bulk of consumption of commercial energy, as can be deduced from the following modal *per capita* use (in gigajoules) as furnished in the May 1992 supplement to *Population Reports*:

Africa	0 - 3
East Asia	1 - 9
Latin America	11 - 25
North America	295 - 321
Western Europe	107 - 169
Eastern Europe	lowest 107 - highest 191 (former USSR)

Since around 1970, however, the Third World, with its proliferating population numbers, has been assuming an increasing role in incremental consumption. Available data allow us to draw the following inference with respect to the relative shares of population numbers (N) and consumption per capita (C) in the increments of commercial energy used during three twenty year periods:

	1930-50	1950-70	1970-90
N	52%	34%	75%
C	48%	66%	25%

These percentages indicate that it was during the period of reconstruction and development of the Western and Japanese economies after the second world war that the intensification of energy use was the major factor in the growth of consumption. After 1970 population growth has become the dominant force. Due to the expansion of their share in the world's population increments - from 77,5 per cent during 1950-70 and 88,7 per cent during 1970-90, and a projected 92,5 per cent over the period 1990-2010 - (UN, 1993, pp 284-288), the influence of the LDCs will probably continue to preponderate, particularly when the newly industrialising countries (NICs) are included in this category.

The historic increase in the use of energy in the industrialised world can, in part, be traced to the demographic changes experienced by them. As their fertility declined, and the growth of the labour force diminished accordingly, labour became increasingly scarce and expensive. In consequence, recourse was had to energy as a lower-cost input substitute for labour.

The South African economy apparently evinces the highest energy-intensity in the world, requiring 0,88 kilogram of oil equivalent per unit of GNP (in 1991 US dollars) generated,

compared to 0,33 for the USA, 0,31 for Australia, 0,22 for the United Kingdom and 0,13 for Japan (World Bank, 1993, pp 238/9, 246/7). Until 1970 South Africa's trend in energy use coincided with that of the developed market economies (or MDCs), but has reversed since then. The high intensity is a function of the conversion of coal into synfuels and deep level mining.

TABLE 7.1
SOURCES OF COMMERCIAL ENERGY

	The World %	South Africa %
Oil	38	10
Coal	30	87
Gas	20	
Nuclear and hydropower	12	3
	100	100

Sources: Viljoen, 1991, p 19; Crews, 1987, p 7.

Table 7.1 informs us that the world, in the aggregate, depends for 88 per cent of its commercial needs on non-renewable oil, coal and gas, with oil showing an eight percentage point larger share than coal. In South Africa, coal with 87 per cent, occupies the dominant position, serving as it does as the base for the production of 90 per cent of the electricity supplied and of synfuels. SASOL produces 39 per cent of South Africa's fuel requirements from 34 million tons (metric) of coal per annum, while the Mossel Bay gas project adds 45 000 barrels a day to Sasol's 150 000 barrels (Sunday Times, 30 May 1993). Mossgas's estimated life is 14,5 years (evidently, if the costs to be covered do not include the interest on the R10 600 million sunk into the project).

The coal production of 1992, a more or less average year, was disposed of as follows (Chamber of Mines, 1992).

	Mill. Tons
Used in the generation of electricity	67,8
Exported	48,8
Synfuels and other industrial uses	44,4
Domestic, and other uses	14,0
	175,0

Directly, by way of its conversion into synfuels, the production of electricity and an intermediate input in industrial activity and, indirectly, through the earnings of foreign

exchange (R4,4 billion in 1993) to buy the oil for the residual amount of energy required, coal is in reality responsible for the satisfaction of the totality of South Africa's commercial energy needs. Coal burned by households for domestic cooking and heating represents only 3,7 per cent of total production, but the amount is rising as traditional, renewable fuel resources are replaced by fossil fuels in the process of urbanisation.

The coal reserves of South Africa have been estimated at 55 333 million tons. While only 20 per cent of these are of higher grades, their share in annual production is almost one-third, thus inducing a continuous decline in the quality of deposits remaining. A sizeable portion of deposits mined consists of discard coal. The saleable portion of coal mined diminished from 87 per cent in 1981 to 77 per cent in 1995 (Grobbelaar, 1995). In the case of coal destined for overseas markets, the discard is as much as 30-35 per cent (IFR, 1993, p 5-75). If the course of expected production levels over time, and accordingly the life cycle of coal deposits, were to describe a normal curve, South Africa appears to have sufficient reserves to last her well into the twenty-second century (Cooper & Kotze, 1992).

However, proven or estimated reserves are not fixed quantities, even in the absence of new discoveries. They are defined, in standard usage, as the amounts that can be exploited at current levels of prices and of existing technology. These two variables can change to add to the amount of a mineral which can be profitably produced or to the lifetime of available resources. For example, of the 41 ton reduction, between 1993 and 1994, in the gold produced in South Africa, 18 tons were the result of a lowering of the grade of ore mined, from 5,5 to 5,3 gram per ton of ore, which was rendered feasible by the increase in the price of the metal (*Die Burger*, June 1995, p 13). Again, in the case of coal there has been a tenfold increase, between 1907 and 1957, in services rendered by an average ton of coal by way of reductions in the energy required for mining, transport, and electricity generation and transmission. South Africa's coal reserves have, indeed, been raised by a factor two over the period of a decade consequential upon an improvement in exploration and evaluation of bore hole cores. (IFR, 1993, p 5-75). And if technology could enable more power stations to use coal with an ash content of up to 40 per cent, reserves could be augmented by 25 per cent.

The oil reserves of the world have been estimated at 1 107 000 million barrels in 1992 (British Petroleum, 1993, p 2). The fears expressed at the beginning of the seventies about the availability of future supplies were caused by the very remarkable rates of increase of consumption. Between 1965 and 1970 it amounted to 49 per cent or 8,3 per cent per annum, but declined to 3,7 per cent per annum during the next five years, and since 1980 it has been no more than 0,4 per cent per annum concomitantly with rising prices demanded by the OPEC countries. At the 1992 Reserves/Consumption ratio, supplies would seem to have a lifetime of 46 years. If, however, the market price of oil were to rise sufficiently tar sands and shale oils will become sources of recoverable reserves. Their unit technical cost of exploitation is,

however, 4 to 8 times that of oil gushing from the earth or pumped out of wells (Jennings, 1989, p 8).

In the nature of things a scarce non-renewable resource cannot be exploited in a sustainable manner, since its consumption cannot but reduce the residual amount available. But not to use it, for this reason, would be economically senseless (unless, of course, the community could derive more benefit by leaving it untouched in its original state, as in the case of, say, coal in the Kruger national park). The theoretical solution to the problem of providing the community with the greatest long term net benefits from its exploitation would be a price level that adequately reflects the increased relative scarcity over time. Apart from conducing to an optimising of the time distribution of consumption, it may also call forth the introduction of alternative sources (such as geothermal energy, hydroelectric power, solar and wind power as substitutes for oil, gas and coal). Failing this (or in addition), sustainability of growth, if not development, would require investment in compensatory productive capacity financed from the scarcity rent of the resource (ensuing from the inelastic supply) or simply from the returns derived from exploiting the non-renewable resource.

Inasmuch as these sources of energy are a substitute for human energy, one would expect rising prices of the former to benefit the employment of labour, which is in surplus supply in the non-oil producing LDCs, and to reduce the pressure on their foreign accounts which tend to record deficits. However, this substitutability may apply only in the more modern industrial sectors of economies, which are not well-developed in the LDCs, and not in the more basic activities of preparing food and heating. And the greater the decimation of renewable resources - to be discussed below - the greater the dependency on imported sources of energy.

7.3 PLANT LIFE

Trees and shrubs represent renewable sources of energy, while smaller plants, grass and some trees are sources of food for animals. The use of the former is positively correlated with the relative share of rural communities in the total population and negatively associated with the level of economic development. It would appear that the world's average *per capita* use of renewable energy sources has remained steady at between 0,27 and 0,28 kilowatts, after declining from 0,35 in 1890, while that of non-renewable resources has almost tripled (Holdren, 1990, p 111). In some sub-Saharan African countries the dependence on traditional fuels (wood, dung and crop wastes) is very high, reaching 86,8 per cent in the Sudan and 94,11 per cent in Malawi (Barnes, 1990, p 48). The demand for wood fuels tends to describe a hyperbola when it is diagrammed against income classes, the middle classes forming the peak. The President's Council (1983) has reported that some 60 per cent of the South African population burns wood for cooking and heating purposes, consuming 14 million tons of wood per annum in the process. A 1993 Human Sciences Research Council questionnaire survey

revealed that some 44 per cent of the South African population (56 per cent in the case of Blacks) did not have a supply of electricity at their disposal (Snyman & De Vos, 1994, p 13) and would therefore have been obliged to use other forms of energy. How these forms differ according to the spatial location of population can be gleaned from the following data (Source: Eberhard, 1989) on net consumption on a *per capita* basis:

	Rural	**Peri-urban**
	%	%
Wood	77,8	48,6
Dung	10,8	-
Coal & Paraffin	11,4	51,4
	100,0	100,0

In the rural areas of South Africa wood and dung account for 88,6 per cent of the energy consumed, compared to 48,6 per cent in peri-urban areas. Even so the lower percentage is not negligible and leads to stripped land around the human concentrations. When the lengthening of the distance between the latter and the source of wood fuels enters into the calculation of costs and price, by way of transport costs, wood gets converted into charcoal, incurring the waste of 50 per cent of the energy inhering in the base.

During the times of low density occupation of land, small farmers and peasant families established a custom, handed down from generation to generation, of harvesting trees and shrubs from fallow land without a thought for a need of human intervention to preserve their energy base. It became part of a traditional way of life in which nature was the provider and regenerator of all plant life, exonerating the consumers from any obligation of replacing the trees and shrubs cut down. In such replacement costs would be incurred while nature's contribution is free. Planted trees would also require some years to reach maturity, thus representing an investment demanding of a fairly long mental time horizon, which is lacking among the traditional community interested in providing for the here and now. The trees and shrubs at issue also suffer from the attribute of being common property, so that it is in nobody's individual interest to practice conservation harvesting: the curse of the commons.

When increasing and high densities of land occupation no longer allowed of shifting cultivation and pastoralism, which used to leave land areas lying fallow for the regeneration of plant life, the self-renewing capacity of the land is exceeded and the stocks of trees and bush are decimated. In the absence of adequate supplies of the latter, dung and crop wastes are being used for fuel, reducing the nutrients available to, and accordingly, the productivity of, the soil. Population pressure, unaccompanied by the expansion of factors of production other than natural resources, becomes responsible for the total damage. The South African Nature Foundation has reported that the country's dry forests have been reduced by 46 per

cent and it's savannah grassland by 62 per cent (1991, p 5).

The distances to be travelled to collect fuelwood for the family become longer and longer, demanding ever increasing time to be spent in the process. Distances of 3,6 to 10 kilometres (one-way) travelled to collect firewood in African countries have been reported which involved travelling time ranging from six hours per week in Kenya, to fifteen in Burkina Faso and more than forty in central Tanzania (Barnes, 1990, p 51). In a random sample survey of subsistence communities in the Ciskei it was found that 58 per cent collected wood every second day and 33 per cent every third day, spending from four to five hours per trip. Supplies had, in addition, to be supplemented by the purchase of fuelwood involving expenditure per family of R11 to R16 per month (Steyn, 1990, pp 57-58).

The increasing manpower requirements of fuelwood collection conduces to the maintenance of a high level of reproduction.

The numbers of people in Africa suffering and facing deficits and acute shortages of fuelwood in 1980 have been estimated at 207 million, and were projected to reach 535 million (out of million) by the end of the century. For Asia the numbers quoted for 1980 and 2000 were 862 million and 1 671 million respectively (*People*, 1983, p 37).

While the scarcity of fuelwood is, in the main, associated with the decimation of open woodlands, the forests (rain and dry) of the earth have a few more adversative forces to contend with: (i) logging, for the purpose of manufacturing furniture and other wooden objects. It is sometimes argued that the high-income countries are the villains of the piece as if they were to blame for providing a market to the Third World which, presumably, would otherwise have had a more sustainable use for their product; (ii) forest clearing, often in the slash and burn manner, to extend the area of cropland and pasture or to establish plantations; (iii) "waldsterben" (or forest death), due to acid rain or other as yet unidentified, pathogens; (iv) practices such as the repeated burning of forest land late in the season when the vegetation, which is tinder-dry, generates very high temperatures which destroy trees (compared to early burning). Logging which leaves large amounts of deadwood and other combustibles on the ground has a similar effect; (v) the cutting down of trees, in Zambia at least (Musambachive, 1992, p 20) to get at edible types of caterpillars which are evidently in great demand among certain tribal groups as well as in urban areas.

In the result deforestation is proceeding apace as the cutting and destruction of trees exceeds the rate of regeneration and replanting. The forest cover of the earth is shrinking by 3,7 per cent per decade and if it continues the *per capita* forest area will be reduced by 30 per cent by the year 2010 (People and the Planet, 1994, p 5). The replacement rate averages 1 for every 10 removed on a world-wide basis, and 1 for every 29 in Africa. The Cote d'Ivoire had some

14 to 16 million hectares of natural forest at the beginning of the twentieth century; there are now only 2 million hectares left. For Ghana the comparable figures are 8,2 and 2 million hectares (Fair, 1992, pp 24-26). In the Third World only 550 000 hectares of land are being planted with trees annually for fuelwood purposes, while 55 million hectares are required to meet its needs - after allowing for a 25 per cent improvement in the efficiency of kilns and cookstoves (Postel & Heise, 1988, p 16). The Third World also appears to be suffering a depletion of tropical forests at a rate of 1 to 1,5 per cent per annum and it may be accelerating. The FAO had put the annual loss in 1980 at some 11 million hectares. The World Bank more recently estimated it at between 17 and 20 million hectares (U.N., 1994, p 8). Compared to 1979 the 1989 loss of 142 200 square kilometres of tropical forests constituted a 90 per cent increase.

Deforestation, apart from spelling the eating into the stock of "natural capital", means that mankind is losing some of the ecological benefits derived from the plenitude of plant life. Trees absorb carbon dioxide and release oxygen, thus counteracting the greenhouse effect. They are very efficient users of rain and act as purifiers of water in streams. They serve as watershed protection and regulator of the run-off of rainwater, thus preventing soil erosion, while contributing to the quality of the topsoil through the production of mulch. It has been alleged, for example, that the Panama canal may be drying up as a result of deforestation in the surrounding hills (World Development Forum, 1987, p 2). They help to stabilise the climate in their environment. Tropical forests are also storehouses of fauna and flora which are sources of genetic materials of potentially great value to mankind. While science has identified 1,7 million species, there may be many millions more, some of which disappear, thus reducing the gene pool, before their beneficial attributes have been revealed (U.N., 1994, p 9). It has been claimed that biologically derived medicines originating from forest species comprise some 40 per cent of prescriptions world-wide, and generate about one-half of the pharmaceutical industry's turnover of 200 billion US dollar (Populi, 1994, p 16). Biodiversity is being reduced. It is maintained that the potato crop failure, which caused a famine in Ireland in 1840, resulted from the narrowing of the genetic base of the strain, in the absence of cross-breeding with disease-resistant wild species; while the maize crop failure in the USA in 1970 had a similar origin (The SA Nature Foundation, 1991, p 4). When the wheat crops of the Swartland in South Africa were seriously threatened by leaf-rust, a wild wheat variety was used for hybridisation with beneficial results.

Forests, woodlands and savannah-lands, together with the wild life supported by them, constitute the base of an industry offering major sustainable benefits to a community, viz. eco-tourism, if conservation practices are followed. It could become a major foreign exchange earner for South Africa, and it has been suggested that for every additional foreign tourist one new job would be created. South Africa's major environmental assets, apart from the scenic beauty of many regions, encompass 5,8 million hectare of protected areas - nature reserves,

national and provincial parks, wildlife sanctuaries, marine and coastal protected areas, which attract hundreds of thousands of tourists each year. The problem in this regard is how to enforce the protection against the encroachment by communities living on the edges of these reserves who depend for their livelihood on the exploitation of natural resources only, and have to be convinced, demonstratively, that eco-tourism redounds to their benefit, while their encroachment is eroding its base. South Africa is evidently still able to manage the stabilisation of the 164 000 indigenous forests remaining, and by extending commercial plantations is enjoying virtual self-sufficiency in the supply of wood and timber. However, the country has 67 of its animal species on the vulnerable list and 24 plant species in the endangered category. The respective numbers in the case of fynbos and Karoo plants are 183 and 118 (S A Dept of Environment Affairs, 1992, p 112).

There seems to be little doubt that the demographic factor - growth and density of occupation - is the dominant proximate cause of deforestation. It is estimated that the inroads of cropland into tropical forests has been responsible for 90 per cent of all deforestation, population growth accounting for 79 per cent and an increase in per capita consumption for 21 per cent of the cropland expansion (Myers, 1994, p 59). Small scale farmers are thought to be accountable for more than a half of the deforestation, their access to the forests having been promoted by logging operations and cattle ranchers (UN, 1994, p 8). For 23 Latin American and Caribbean countries a co-efficient of correlation between population density and forest cover of -0,48 significant at the 0,02 level, was found, and if this did not sound very convincing, the researcher wrote, it can be pointed out that at least, there was no relationship between *per capita* income and forest cover (Bilsborrow, 1994, p 127).

When natural resources are the only co-operant factor of production with human labour they have to bear the brunt of the burden of population growth. The burden is aggravated when the latter is accompanied by ignorance of cause and effect or avarice.

7.4 THE ATMOSPHERE

7.4.1 The Greenhouse Effect

Man consumes clean air by polluting it with noxious gases and particulates (dust, smoke, fungal spores and pollen), giving rise to three crucial environmental phenomena: the greenhouse effect, ozone depletion and acid rain.

The Council for Scientific and Industrial Research (CSIR), which runs an Atmospheric Impacts Management Programme, has produced an inventory of greenhouse gases released in South Africa, and their shares in the greenhouse effect as measured by their global warming potential (GWP, or heat trapping ability). This is reproduced in Table 7.2 (Van der Merwe,

1994, p 1).

TABLE 7.2

GREENHOUSE GASES RELEASED IN SOUTH AFRICA

Gas	Metric ton per annum	GWP
Carbon Dioxide	290	49%
Sources: Coal burning	(65,5%)	
Liquid fuels	(29,0%)	
Cement manufacturing and others	(5,5%)	...
Methane	2,25%	24%
Sources: Coal Mines	(35,0%)	
Ruminants	(33,0%)	
Landfills	(16,5%)	
Vehicle exhausts	(15,5%)	
Fuelwood & vegetation burning	(7,0%)	
Soils (sink)	(-7,0%)	
Nitrous oxide	0,47	21%
Sources: Coal burning	(83,0%)	
Others	(17,)%)	
Chlorofluorocarbons (CFCs)	,0064	6%
Sources: Refrigerants	(39,0%)	
Aerosol propellants	(31,0%)	
Others	(30,0%)	
TOTAL		100%

The 49 per cent share of carbon dioxide (CO_2) in the greenhouse effect seems to accord with the world average (Myers, 1994, p 60). Its heat trapping ability per molecule released into the air is, however, much lower than that of the other three gases: methane (1/60), nitrous oxide (1/260) and CFCs (1/5500). From these figures it is deduced that coal - mining and burning - accounts for 58 per cent of the greenhouse gas emissions in South Africa, which is not surprising in light of the energy situation described in section 7.1. Vehicle exhausts in the methane category appear to be only responsible for 3,7 per cent. Add the contribution of liquid fuels (14,2 per cent) and we arrive at 76 per cent as the share of fossil fuels in the greenhouse effect. (It may be slightly higher since not all oil-based fuels have been included

in the inventory). The burning of fuelwood and vegetation contributes very little (1,7 per cent), landfills some 4 per cent, while 7,9 per cent emanates from cows and other ruminants (as shown in the methane category).

In addition to these gaseous pollutants, the atmosphere is also subject to particulate pollution, which can reach very high levels where there is a concentration of population and industries. In the Vaal Triangle it was found to exceed the international health standard by two-and-a half times, 40 to 70 per cent of it resulting from coal burning by households and dust, and the remainder from vehicles and industrial activity (Terblanche, 1993, p 1). During a twelve hour monitoring period in the rural areas, the exposure to total suspended particulates (TSP) in the sleeping quarters and the cooking areas respectively, registered levels 4 and 8,6 times that of the WHO no-effect exposure limit (Terblanche, 1992, p 1). From Cape Town it was reported that the pollution from car vehicle exhausts had increased by 80 per cent during the ten year period 1983 - 1993, and could double in another ten year's time (Sawyer, 1993, p 1).

The wall chart supplement to the May 1992 *Population Reports* indicates that of the countries of Africa, South Africa shows the highest *per capita* emission of carbon dioxide, viz. 8,1 metric ton per annum. For the rest, apart from the other two outlier values, viz. of Gabon, 6,9 and Libya 8,7, the amounts vary from 0,0 to 1,7. As is to be expected, the values in question are positively correlated with the *per capita* amount of energy used. They are 17,3 tons *per capita* in Canada and 19,7 ton in the USA, and vary between 5,9 and 11,0 in Western European countries. The amounts are very high also in the largest of the OPEC producers: 12,8 for Saudi-Arabia, 15,8 for Kuwait and 32,9 for the United Arab Emirates.

In the literature on greenhouse gases released on a global scale, discussion is focussed mainly upon the carbon dioxide element (responsible for half of the heat trapping pollutants) and is conducted in the developing/developed country (or LDC/MDC) dichotomous terms, the former representing the dominant influence of population growth and the latter the effect of affluence. Population exerts its influence mainly by way of deforestation as a means of procuring food and/or income for growing numbers, while affluence is associated with the high intensity use of fossil fuels. Deforestation causes the carbon contained in the trees, and some of it present in the soil underneath, to be exodised, adding to the carbon dioxide stored in the atmosphere, while the stock of trees, that acts as a sink for CO_2, is reduced. Any warming of the atmosphere resulting from this process may have a feedback effect if it increases the transpiration rates of trees to the level where it exceeds the rate of photosynthesis (in which the sun's energy induces CO_2 and water to combine to produce carbohydrates). Photochemical reactions arising from the burning of trees, shrubs and other vegetation may introduce ozone into the lower atmosphere (or troposphere) which has the effect of a minor greenhouse gas (Van Wilgen and Scholes, 1994, p 45). The CO_2 released by the fires will, however, be absorbed by the regrowth if their frequency remains unchanged,

while these fires are, in fact, a condition for the survival and reproduction of some fauna and flora.

While the LDCs are responsible for some 95 per cent of carbon emissions due to deforestation, their share in the global release of CO_2 into the air is a great deal smaller, even while they contain 76 per cent of the world's population, since they make much less use of fossil fuels which are responsible for the bulk of carbon emissions, adding some 6 billion tons annually compared to 0,8 to 2,6 billion tons on account of tropical rain forest clearing (UN Secretariat, 1994, p 29, Birdsall, 1994, p 47). A multiplication of the *per capita* carbon dioxide amounts released as presented in the Population Reports wall chart, quoted above, by the respective population numbers, results in a 28 per cent share for the LDCs. Birdsall's estimate is 33 per cent, made up of a 20 per cent share in fossil fuel consumption and a 95 per cent responsibility for deforestation (p 40). Inasmuch as it is the accumulated store of emissions retained in the atmosphere which is decisive for the greenhouse outcome, the MDCs have to be debited with rather more than the 67 per cent or 72 per cent apportioned to them in view of the post-war spurt in their consumption of energy, and the legacy of the Industrial Revolution. At the start of the latter the carbon dioxide concentrations measured 250 parts per million. Of the addition of 70 parts during the past hundred years, half has occurred during the last thirty years. A continuation of this rate of increase will double the level from pre-industrial times over the coming eight decades (Holt-Biddle, 1994, pp 31-41).

If we want to identify the influence of population in this atmospheric drama we can postulate that the rate of increase in carbon dioxide emissions is determined by the rates of growth of population, GDP *per capita*, energy intensity of the GDP and the carbon intensity of the energy used (The Population Council in U.N., 1994, p 283). Myers would have it that of the 3,1 per cent per annum increase in CO_2 emissions during 1950-95, population must have been responsible for 1,9 percentage points and the other three determinants for the remaining 1,2 (1994, p 60). This apportionment to the population factor could conceivably have been valid for the 1970-90 period in light of our calculations, presented in section 7.1, of the relative significance of population growth and the consumption of commercial energy *per capita*. Other authors, attributing smaller current shares to the population factor, do project increasing contributions in the future. Since the LDCs are moving increasingly into the acceleration phase of the sigmoid curve, they are projected to double their *per capita* rate of emissions from 0,8 to 1,7 billion tons per annum if they continue on their course of the past 40 years over the ensuing 1985-2025 period, at the end of which their population growth would have added 5,8 billion tons, compared to a current world total of 6,9 billion tons (Myers, 1994, p 60). When a response is sought to the question, how much of the emissions could possibly be averted by feasible reductions (not zero growth) in projected population growth, the answer is, not much: by way of the deforestation process (with an elasticity with respect to population growth approximately 0,5) about 6 per cent, and of lesser fossil fuel emissions, some 10 per

cent (Birdsall in U.N., 1994, p 39).

These computations still leave out of account the emissions of methane, nitrous oxide and CFCs responsible for the other half of the greenhouse effect. In South Africa coal has a share of one-half of this one-half, but it is not known whether in the rest of the world oil would fulfil the same role. The first two types of emissions are probably due to grow in relative significance as the campaign against fossil fuel and CFC pollution gathers further momentum. Recent data would indicate that, on a global scale, the burning of vegetation (biomass) could contribute as much to the greenhouse effect as fossil fuels. When we apply the heat trapping capacities of CO_2, methane, nitrous oxide and CFCs, as derived from Table 7.2, to the data published in *World Resources, 1992-93* (pp 248/9, 350), the result shows that the effect produced by CO_2 emissions from land-use change and by methane from anthropogenic sources almost equals that emanating from fossil fuel consumption and CFCs.

In respect of annual additions it would appear then, that the population factor and nature are already responsible for a larger share than affluence, or would become so on an increasing scale in future.

The concern about the greenhouse gases arises from their potential effect upon the earth's climate and as a health hazard and, accordingly, upon the economic well-being of inhabitants. Their accumulation in the troposphere traps low-energy, long wave (infrared) radiation, preventing some of the heat of the earth's surface (received from the sun) which would otherwise have been radiated back into the stratosphere, from doing so. The result is a warming of the earth. There is the possibility of a feedback effect emanating from the transpiration of trees, already explained above, and from the oceans which could become net sources of carbon dioxide emissions instead of sinks, since the rising temperatures will cause them to release carbon to add to the warming of the earth.

Mathematical models, constructed in attempts to quantify likely changes in average temperatures, arising from a doubling of the CO_2 content of the atmosphere, have predicted increases varying from 1 to 4 degrees centigrade. While this appears insignificant compared to day-to-day and day-night changes in temperatures, it can, on a global scale, be critical. The degree of warming and its effects will differ greatly from region to region. Greatly feared is the possibility of the melting of polar ice, one per cent of which could raise sea levels by 75 centimetres, inundating large tracts of low lying, coastal areas and necessitating the transmigration of perhaps millions of people (IFR, 1990, p 6-140/1). It has been suggested that the Cape Flats may be flooded within eighty years' time which would destroy the bread basket of the area (Du Plessis, 1988, p 1). Salinity levels and the distribution of plankton will be affected; plants will grow faster as a result of CO_2 enrichment, but will require more fertiliser; the location of the main food producing regions will shift.

Application of some of the models to the South African situation indicated a modest increase in precipitation in the summer rainfall areas, greater summer precipitation in the winter rainfall areas, and a desiccation in the latter and in the Karoo. The frequency of floods and droughts may increase. Dryland maize production may be reduced due to moisture stress; in the winter rainfall area wheat production will be adversely affected, while there may be a change in the cultivars of grapes and deciduous fruit most suited to the new climatic conditions. Subtropical crops may flourish (du Pisani & Partridge, 1990, pp 307-309). Other findings on the effect of a doubling of the CO_2 concentrations were that "Southern Africa may be subject to increases in mean temperature ranging from 3 to 6 degrees centigrade, and decreases in available soil moisture ranging from 11 to 19 per cent. At the same time the sea-level may rise by up to 1,5 metre" (Brink, *et al.*, 1990, p 434).

In the face of such alarmist projections, particularly when they are presented as predictions, responses counselling healthy scepticism are almost inevitable. Critical observers can point out that the earth always had, and has to have, a greenhouse mechanism, a blanket of atmosphere consisting of greenhouse gases, to moderate its surface temperature and prevent its fluctuating between unbearably cold and hot. And since nature has been generating the greenhouse gases since times immemorial it may claim a share equal to that of man. Nature must be debited with the responsibility of volcanic eruptions which have spewed forth huge quantities of noxious gases and particulates, infinitely larger than any man could have produced (Maduro & Schauerhammer, 1992; Ray, 1989; Lave, 1988). Climatologists are puzzled by the difference between quantities of gases released and the amounts arriving in the atmosphere. (The Economist, 1994, p 17). There is great uncertainty about the possible changes in climate that may be caused by the gases, while better statistical techniques are required to distinguish natural climate variability from man-induced change (Fernau, *et al.*, 1993; Joubert, 1990). There is also uncertainty about the speed with which ecosystems can adapt to climatic change.

At the close of the Rio Summit 425 members of the scientific and intellectual community signed the Heidelberg Appeal which stated, amongst others, that while they subscribed to the objective of preserving resources, this should be "founded on scientific criteria and not on irrational pre-conceptions" and that "the greatest evils which stalk our earth are ignorance and oppression, and not Science, Technology and Industry whose instruments, when adequately managed, are indispensable tools ... for overcoming major problems like overpopulation, starvation and world-wide diseases" (Handbill: *Heidelberg Appeal to Heads of States and Government*, 1992, circularised by M Salomon, co-ordinator, Heidelberg).

However, when an executive of Sasol, an enterprise responsible for carbon dioxide emissions, maintained that it was not a serious threat to the environment and that the theories of global

warming remained unproven, his pronouncements were decried by an ecologist as disgraceful (Yeld, 1990, p 6).

There is consensus, though, that air pollution is a health hazard. There was the well-known 1953 London smog which killed almost 6 000 persons, especially the sick and infirm. Between 12 and 17 October 1993 the notorious *Nefos* (from vehicle exhausts) of Athens was responsible for the hospitalisation of 730 persons suffering from cardiac and breathing problems or spells of dizziness (Interchange, 1994, p 6). In San Francisco photochemical smogs can bring traffic to a halt. The WHO found that in 20 megacities (ten million or more inhabitants by the year 2000) at least one major pollutant exceeded the level deemed healthy, and is implicated in the rise in the incidence of allergies such as asthma (The Economist, 1994, pp 89-91). It is estimated that in South Africa 20 to 25 million people inhale air inimical to health because of the use of cheap but dirty and energy-inefficient household fuels, such as wood, dung and crop residues in the rural areas and coal in towns. Maladies can range from acute eye irritations to upper respiratory tract infections to cancer (Terblanche, 1993, p 6). Living in shacks and cooking on open fires involve much higher health risks than living and using stoves in a formal structure. Compared to electricity the use of coal can raise the risk of respiratory illness by a factor 9,3, and the lower one moves down the energy spectrum - which in practice invariably means the lower the p.c. income - the higher the health risk (National Electrification Forum, 1994, p 2). In the 1995 October Household Survey one-third of those interviewed reported that pollution in winter was rendering their breathing difficult (CSS, 1996, p 78).

7.4.2 Ozone Depletion

Ozone is the three-atom form of oxygen forming a stratospheric layer which shields the earth from the sun's potential excess and harmful ultra-violet radiation (UVR). Compounds containing chlorine and bromine, when released into the air, are broken down into their constituent elements by the UVR, which elements are responsible for the destruction of the ozone. A complex chain reaction is set into motion which causes one chlorine atom to lead to the destruction of 100 000 ozone molecules before the chain-reaction, in which molecules of ozone are converted into ordinary oxygen, is halted. The most serious threat to the ozone is said to originate in the CFCs, already identified as greenhouse gases in Table 7.2. Bromine is a less serious threat than the CFCs but per atom it is 40 times as effective as chlorine emanating from the latter. Its origin is in the halons used in fire extinguishers. In the same category we have methyl bromide produced by natural fires in wood- and grasslands, the quantities equalling those generated by marine plankton and pesticides (New Scientist, 1994, p 11). An insidious attribute of these trace gases is their long average lifetime in the atmosphere: 75 to 110 years for the CFCs and 110 for the halons. Nitrous oxide, among the lesser ozone-affecting trace gases, which include carbon monoxide and dioxide and methane, has a lifetime of 150 years (UN Environment Programme, 1987). Which means that the effect

of these gases will linger on for many decades even if the 1987 Montreal Protocol, which called for a 35 per cent reduction in CFC production by the end of the century, were observed.[1] South Africa, a signatory, has already fulfilled more than the obligations agreed to. In 1984 British scientists measured a hole in the ozone layer of the Antarctic, the size of the USA. Its size and depth varied from season to season. In more recent years it was discovered that ozone concentrations have diminished to record levels over large parts of the planet. Trace gas molecules are blown by winds and pushed by updrafts of warm air to all corners of the stratosphere. Air samples from Cape Point have shown the concentration levels of a widely used CFC (F-11) to have risen from 160 to 240 parts between 1980 and 1988 (Macdonald, 1993, p 6).

With UV-radiation increasing by two per cent for each percentage diminution in ozone concentration, the holes in the ozone layer (or reductions in its concentration) can cause extensive damage to plant, animal and human life, by way of the effect of UV-b on DNA molecules and proteins. It has been demonstrated that UV-b interferes with photosynthesis to reduce plant productivity. Microscopic plants in the surface waters of the oceans, the beginning of the aquatic food chain, are particularly sensitive to increased intensities of UV-b. Exposure to UV-b impairs the human body's immune system which combats infections and the growth of cancer cells. The incidence of skin cancer is estimated to increase by 3 to 6 per cent for every 2 per cent increase in UV-b, while bilharzia may have easier access through the human skin. Eye cataracts may be generated.

While most of the scepticism which greeted the initial presentations of the ozone depletion theory has been dispelled, there is still some difference of opinion, particularly in the matter of causation. Maduro's and Schauerhammer's research (1992) led them to the conclusion that if chlorine is the culprit, CFCs as a source fade into insignificance. The Antarctic volcano Erebus releases a thousand tons of chlorine into the air each day, and in one week's time more than a year's production of CFCs. The latter would contain 0,75 tons of chlorine compared to some 649,4 million tons which would originate in natural causes: the oceans, volcanoes, fires and sea life such as plankton and algae. And, moreover, the results shown by measurements of depletion are a function of the time period selected. It was suggested that manufacturers of CFCs might have promoted the campaign against their use, since profit was to be made out of the development of substitutes such as HCFC-22 which have comparatively short atmospheric lifetimes (Spaarwater, 1993, p 5).

Another writer believes that in the ozone saga propaganda has prevailed over scientific fact because of the financial and bureaucratic vested interests involved. Roberts points out that the inventor of the satellite ozone monitor has noted that no global reduction in ozone levels has

[1] International conferences of more recent times advanced the phasing out dates.

been detected and that historical readings of Antarctic levels - influenced by exceedingly cold polar nights that freeze nitrogen oxides out of the stratosphere during some months of the year - are inconsistent with the CFC build-up theory (1994, p 9). Pearce (1994, p 7) reports that a geophysicist from the University of Virginia, Fred Singer, told a meeting that the main device used to measure levels of ozone, is confusing the latter with sulphur dioxide. But other scientists, admitting the possibility of such confusion, maintained that they have been aware of this since the early 1960s. A South African scientist (Kies, 1993, p 7) points out that the amount of ozone is a matter of equilibrium in a never ending process in which UV rays collide with oxygen molecules to release free oxygen atoms, which combine with oxygen molecules to form (three-atom) ozone. If this scepticism is well-founded, the attribution of an 84 per cent responsibility for the ozone depletion to the developed countries and, concomitantly, to the affluence factor, becomes less than relevant.

7.4.3 Acid rain

Sulphur dioxide, nitrogen oxides and non-methane hydrocarbons and related products, introduced into the air by the burning of fossil fuels, car exhausts and by other industrial activities, combine in the atmosphere with moisture to produce sulphuric and nitric acid which lowers the pH value of rainfall. The result is the so-called acid rain. High sulphur dioxide emissions are associated with poor quality fossil fuels with a high sulphur content in areas of human and industrial concentration. In the Eastern Transvaal Highveld, where electricity is generated in coal-fired power stations, emission densities reach 30 to 40 tons per square kilometre - equalling the worst conditions in the USA and Europe - while the total quantity released in South Africa as a whole is 2,8 million tons per annum (IFR, 1993, p 5-110).

Since SO_2 is co-existent with other air pollutants and since factors other than pollution might have an effect on health, distinguishing its effect is problematical. The Economic Commission for Europe, investigating the impact of environmental degradation on health in Central and Eastern Europe (UN, 1994, pp 225-234), found that while no incontrovertible causal connection between air pollution and specific health problems could be established, the episodic evidence indicated a significant negative relationship. High sulphur dioxide levels are associated with chronic obstructive pulmonary disease and acute respiratory infections (increased asthma and bronchitis). This gas forms part of the air pollutants which were depicted as health hazards in section 7.4.1 (greenhouse gases).

The CSIR Forest Science and Technology Division found that tree nutrition can be impaired by acid rain through the acidification of the soil which could inhibit root growth, and in consequence of resulting losses of nutrients from the foliage (Olbrich, 1993, p 2). The long term fertility of the soil can be reduced. Without apportioning blame to power station and

vehicle emissions in the Eastern Transvaal Highveld, the CSIR reported damage to trees in that area which could have been caused by acid rain or sulphur pollution.

In Europe almost 50 million hectares of forests, or 35 per cent, have been subject to *waldsterben*, while the health and vigour of major species of conifers and broad-leafed trees and, perhaps, the forest ecosystems themselves, are threatened (Brown, *et al.*, 1990, 1994). Without posing it as incontrovertible fact the phenomenon is being linked by writers to acid rain or its source. It has also extensively damaged lakes in many parts of the world, rendering them incapable of supporting sensitive aquatic life, reducing their fish population, or simply leaving them devoid of fish (IFR, 1990, p 6-124).

Sulphuric acid from the air also reacts with the calcium carbonate present in buildings, monuments and statues to cause decay, while motorways can suffer concrete rot. Repairing the damage can absorb large amounts of economic resources.

There appears to be little doubt that industrialisation, responsible for higher levels of living but, which, of course, could also be required just to keep people alive (with living standards constant), is the major source of the affliction discussed above.

7.5 WATER

7.5.1 Water quantity

If available water is defined as the amount of non-evaporated precipitation, there is enough on a global scale to satisfy the needs of a population twice the size of the present number of inhabitants. However, from the point of view of economic welfare water scarcity or abundance cannot be defined thus, regardless of time, place and quality. The rainfall can vary from year to year, or over longer cyclical periods, its location need not coincide with that of human settlements, and its quality, even before it reaches the ground (e.g. acid rain) but particularly when it has been collected or stored in rivers, acquifers, pools, lakes and reservoirs, may not meet the requirements of plant, animal and human life, and may be inimical to it.

While nature constitutes the ultimate supply constraint, man's handling of the free gift of nature determines its life-supporting potential.

The spatial distribution of precipitation is very uneven: As between countries the annual water resources *per capita* available (for the year 1990) varies from a maximum of 140 000 cubic metre in Gabon, 117 500 in New Zealand, 109 400 in Canada, down to zero for Egypt and Kuwait. The percentages of population without safe drinking water vary from 0 in many

industrialised countries to more than 80 in fifteen other countries in the same continent. Percentages of people without sanitation services (in 1988) exhibit an even greater variance: there are 13 African countries in the 80-96 percentage bracket while in Afghanistan it is one per cent short of 100. In the richer countries it is 0 or close enough to zero (Population Reports, 1992). Defining water-scarce regions as those where there are more than 600 persons per million cubic metres available water, 26 countries (300 million people) have been classified within that category in 1990; and the number is expected to rise to 65 (3 000 million persons) by the year 2025 (Falkenmark, 1993, p 10). Another professor of hydrological science has put the water-shortage countries for the latter year at 96 (6 400 million persons) (Golubev, 1993, p 34). Other researchers have predicted that, over the next half-century, water scarcity will be replacing oil as a source of international conflict (The Futurist, 1994).

Country aggregates, however, do not tell the whole story, since within the same national borders regions may experience widely different meteorological conditions.

South Africa, with an annual rainfall of 497 millimetres in the aggregate against a world average of 860 millimetres, rates as a semi-arid country. Its average annual *per capita* runoff, at 1 400 cubic metre, is slightly more than one-sixth of the world's average. Some 65 per cent of the country receives less than the average - which is considered the minimum requirement for dry land farming - and one-third of this area registers even less than 200 mm. per annum. Some of the former Black Homelands, incorporating the erstwhile independent TBVC countries and six self-governing territories, are rather better served with precipitation than the rest of the country. Covering, in the aggregate, 13,6 per cent of the South African surface area they receive 26,8 per cent of the rainfall (Kriel, 1983, p 27).

The effective use that can be made of available water is influenced by the intermittence of wet and dry seasons and the time distribution of rainfall during the wet season, which is during the summer in the northern parts and during winter in the south-western parts of the country. When rains do not arrive at planting time and the growing season, crops will not be produced at all or will fail. Because of this climatic deficiency and repeated droughts, crop failures are frequent occurrences in South Africa. Maize production, for example, has varied between a high of 14 million tons and a low of 4 million tons between 1951 and 1984. The latter event is a twofold disaster: the GDP is reduced by around R5 000 million, and some R1 000 million has to be expended in scarce foreign exchange on the importation of maize to satisfy domestic needs. Even bounteous crops were not an unmixed blessing since taxpayers had to bear the burden of the difference between the guaranteed domestic price and the lower price fetched on overseas markets.

With regard to industry, the Chamber of Mines has calculated that a cut in electricity supply

of 20 per cent due to water shortages over a period of some months would result in a loss of R1 329 million in foreign exchange, of R503 million in tax revenue and of 50 000 jobs (IFR, 1990, p 6-46).

To minimise the effect of rainfall variability on the supply of water, and to provide urban communities with a steady flow of water, dams and reservoirs are, and have been, constructed. If such construction were to make provision for the extremes in runoffs - from floodwaters in some years to severe droughts in others - it would constitute an inefficient use of resources, since much of the stored water would be wasted through evaporation. There are very few areas in South Africa where the average annual potential evaporation is less than the average rainfall (Waterwese, 1986, p 1.6). The advice proffered by a hydrologist in this regard is: "Use water lavishly during times of plenty otherwise it will merely evaporate, but be prepared to reduce demand when storage drops to reserve levels". To this end the pricing system has to be employed (Midgly, 1984, p 61). As it is, South African urban dwellers are paying less for their potable water than those in some countries with larger volumes of *per capita* water resources: R1,68 per kiloliter compared to R2,13 in Sweden, R2,45 in Canada, R2,82 in the United Kingdom and R3,41 in France (Pansegrouw, 1994, p 47).

The high rate of evaporation in South Africa, in combination with the variability, reduces the effective volume of water available from an annual runoff of 53 500 million cubic metres to 33 million, or 62 per cent. To this 5 400 million cubic metres from underground sources can be added (Waterwese, 1986, p 1.3). This renders dryland farming a hazardous occupation in the greater part of the country (with a non-temperate climate), while irrigation farming is not risk-free.

While storage capacity is increased by the construction of new dams, that of existing ones is being reduced by the silting up process resulting from soil erosion. The reduction is almost 10 per cent per decade in regions subject to high risks of erosion, concomitantly with the release of more than 120 million tons of silt into the river system each year (Waterwese, 1986, p 38).

The construction of dams in itself can be a controversial issue. In its wake there is flooding of land which might have been used for agricultural purposes and which involves the translocation of people, or could be prejudicial to the interests of communities downstream, in the case of rivers, or interfere with the eco-system. Compensating for meteorological deficiencies is not a costless activity, apart still from the fact that the stored water has to be transported, over long distances, in some cases, to the locations where the need exists. The Pretoria-Witwatersrand-Vereeniging (the Gauteng province) region is a case in point. It developed into the major industrial area in South Africa responsible for 77 per cent of mining production (and 58 per cent of overall industrial production) and accommodating 32 per cent of the country's urban population, as a result of the impulse originating from the discovery of

gold, and, accordingly, without reference to surface water supplies. Its runoff is only 8 per cent of the South African total. Its main source of supply is the Vaal Dam, located some seventy kilometres from Johannesburg and still further from Pretoria, the water level of which drops to 14 - 16 per cent at times, and compels rationing and has to be fed from catchment areas some of them hundreds of kilometres away. It has been decided that the Lesotho Highlands project, 350 kilometres from the Vaaldam, is the only viable and affordable source of future supply.

Of the ten largest dams only the Vaaldam and the Theewaterskloof scheme in the South Western Cape, are intended to cater primarily for household needs. The others provide water predominantly for agriculture, which is indeed responsible for consuming a major portion from both surface and ground water sources. The latter are used for irrigation to the extent of 78 per cent, for stock-watering 6 per cent, mining and quarrying 5 per cent and households 11 per cent (Rapport, 1995, p 15). Of the water used from the two types of sources agriculture has a two-thirds share.

TABLE 7.3
WATER DEMAND BY ECONOMIC SECTOR IN PER CENT

	1980	**1990**	**2010**
Households & municipalities	12,4	15,4	20,9
Mining & industry	14,5	16,2	21,0
Irrigation & stock-watering	71,6	67,2	57,2
Nature conservation	1,5	1,2	0,9
	100,0	100,0	100,0

Source: Dept. Waterwese, 1986, p 24. The percentages were based on the total of direct use of water, and not on total direct plus indirect use as the department of Water Affairs has done.

The proportions demanded by industry and mining and by households, at projected 1990 levels of 16,2 per cent and 15,4 per cent respectively are very much smaller. The demand originating in all the sectors is expected to increase, but more rapidly in the latter two sectors than in the others, so that the share of agriculture is due to decrease from 67,2 per cent in 1990 to 57,2 per cent by the year 2010. If the post-1994 government's promises about the accessibility of all South Africans to safe water are to be realised, the supply to households will have to increase faster than envisaged in the above projection, and provision will have to be made for a considerable expansion of water storage capacity. It has been estimated that of the urban population 20 per cent, or 4 million, persons have minimal water supply provision and 30 per cent, or 7 million, have minimal sanitation (Van Ryneveld, 1994, p 100). The Development Bank of Southern Africa (DBSA) found that of the 16 500 000 persons living in the rural areas only 53 per cent had access to safe water and 14 per cent to proper sanitation

(1992, p 28). According to the Water Research Commission some 9 million people in the country as a whole do not have access to safe water while twice as many do not have proper sanitation services at their disposal (Brand, 1992, p 9). The mushrooming of squatter camps exacerbate the problem. In the 1995 October Household Survey 11,5 per cent of those interviewed reported an inadequate water supply, while 41,4 per cent did not have flush toilets at their disposal (CSS, 1996, pp 59, 69). Arising from this situation and the declaration in the Bill of Rights, Constitution of South Africa Section 27(1)(b), that "everyone has the right to have access to sufficient water", the Department of Water Affairs and Forestry formulated a new national water policy in its 1997 White Paper, the essence of which is that "all water in the water cycle whether on land, underground or in surface channels, falling on, flowing through or infiltrating between such systems, will be treated as part of the common resource ..." (p 4). This envisaged comprehensive state control over water earned the policy the title of "the nationalisation of water". All water use will be subject to a catchment management charge and a resource conservation charge, the latter where there are competing beneficial uses. Some or all of the charges may be waived in the case of disadvantaged groups, in the interests, so it is claimed, of equity. The economic problem is that the waiver would probably have to apply where the cost of water supply would be highest, that is, where rural communities are thinly scattered over large areas (and the economies of concentration cannot be realised).

Considered as an ultimate constraint to the proliferation of human numbers the availability of water in South Africa would allow, according to the (now defunct) President's Council, of a population of 80 million, after which the volume demanded will exceed the volume supplied (1983, pp 161-164). This is double the 1994 population size. The numbers that can be supported will depend, of course, on the future levels of *per capita* consumption, the use of technology in the economising of water and the control of forces impacting upon its quality. But the 80 million population size is not an optimum - as the Council would have had it - but one of crisis dimensions.

Population growth, by way of its demands upon water supplies for household purposes and for the production of food for its sustenance, is the chief assailant upon limited water resources. Using the initial and the most recent peak agricultural years, or five-year averages around them, as reference, it is found that South African agricultural production (in terms of value added) increased at exactly the same rate as the population, though the production of the staple foods - grain, vegetables and meat - lagged. There is no sense in insinuating disapprobation or censure by pointing to large *per capita* volumes of water used in countries, or regions of a country, which have high levels of precipitation and perennial rivers, compared to arid and semi-arid regions, as long as the former do not deprive others of water by actions which are not market-related. Neither is it economically sensible to suggest, for example, that water in the Western Cape should be used to produce staple food instead of

wine and fruit, when the latter can earn foreign exchange with which more food can be bought in foreign markets than would have been produced in the Western Cape.

At the international level two examples can be noted where the conversion of availability of water into accessibility courted disaster. Hinrichsen writes a "requiem for a dying sea" when he tells the story of the Aral Sea which used to be the fourth largest lake in the world (1995, pp 10-13). To irrigate cotton fields and rice paddies canals were constructed which diverted water from one of the river systems which replenish the lake. Between 1960 and 1995 the water front had receded 70 kilometres from the former seaport, reducing the surface area of the lake by more than one half and causing a salinity level too high to sustain fisheries. From 3 000 in the late sixties, the number of fishermen in the seaport dropped to 250 to harvest the four species, surviving in the delta's polluted waters, out of an original 22. Stretching across the continent the Sahel in northern Africa has a harsh climate with rains concentrated mainly between the end of June and early October followed by scorching heat. The grazing in any specific locality does not last long enough to support livestock during all the months between rainy seasons, which, in some areas, produce as little as 50 millimetres of precipitation. Accordingly, the nomads moved around to seek pastures for their herds guided by knowledge handed down from generation to generation. Long run equilibrium between man and nature has been maintained over successive periods of normal rainfall and drought by concomitant variation in the size of herds as well as in human survival. International aid changed this. To lift the water constraint imposed by the climate the logical step was to access the underground water. And so thousands of boreholes were sunk which also lifted the constraint on the proliferation of livestock numbers, and herds expanded in accordance with the stock-watering capacity of the boreholes. The long drought which started when the rains failed in 1968 did not affect this capacity but left the livestock with nothing to eat except sand (which was found in the stomachs of the majority of animals brought to the abattoirs). Millions of them died. A journalist described the scene as follows: "enormous herds, converging upon the new boreholes from hundreds of kilometres away, so ravaged the surrounding land by tramping and overgrazing the limited forage that each borehole quickly became the centre of its own little desert 100 to 130 kilometres square" (Sterling, 1974, p 30).

7.5.2 Water quality

Given the quantity of water available and accessible its effective utility to humankind will be reduced by the degree to which it has been polluted or otherwise defiled and the produce, to which it is host, has been abused. As water circulates in the atmosphere-land-atmosphere hydrological cycle it is subjected to pollution from many sources. Raindrops and snow may return to the earth the gases and particulates mentioned in section 7.4. As the rain permeates, or flows over, the soil it may absorb or transport a number of pollutants such as organic and radioactive wastes, organic micropollutants, metals, nitrates and other agricultural and

industrial chemical residues. The Department of Environment Affairs has identified dozens of types of these pollutants and their physical impact ranging from the aesthetically objectionable effect to genetic damage and health hazard (1991). The sources of pollution, basically, are sewage, municipal solid wastes, industrial wastes and use practices. The first three are particularly relevant in respect of groundwater.

Groundwater pollution is attenuated by the natural environment where land is sparsely populated and the wastes are organic in nature and naturally biodegradable. In urban concentrations the natural environment's capacity for attenuation is exceeded, necessitating waste disposal and treatment facilities. When these are lacking or inadequate, garbage (solid wastes) is left uncollected, as happens in the case of 30 to 50 per cent of that generated in LDC urban centres (UN, 1994, pp 32/33), or in South Africa when there is violence in the townships or inhabitants refuse to pay for services rendered. This is fertile breeding ground for water- and foodborne infections. Where the refuse is collected it is usually dumped in open landfills which can be the origin of leaches which are formed when water infiltrates decomposing waste and which is a more potent pollutant than direct contact between groundwater and wastes. Waste disposal can produce high ammonia concentrations, as a result of the decomposition of aquatic life. In the absence of water-borne sewage disposal the use of bucket or pit latrines can raise the nitrate concentration which is especially harmful to infants. Concentrations higher than the critical level (in health terms) have frequently been found in the borehole water of informal settlements (Brink, *et al.*, 1990, p 435).

Benneh (UN, 1994, p 159) phrased the problem of cities in this connection succinctly as follows: "Just as nature cannot concentrate the resources needed to support urban life, neither can it dispense the waste produced in cities". South Africa handles about 48 million tons of domestic garbage each year at a cost of from 10 to 20 Rand per ton (Betty, 1991, p 7).

The most important aquifer in South Africa, the dolomitic rock strata of the Transvaal, is located in, or close to, the largest Witwatersrand mining operations, which latter require the removal of large volumes of high quality water, thus depleting the groundwater-table. Side effects take the form of subsidence and sinkholes which can have catastrophic results. Since 1962 thirty--nine people have lost their lives in sinkholes which have caused damage exceeding R70 million (Brink, *et al.*, 1990, p 435). The water pumped from the Free State gold mines has a salinity level which precludes its use for household and agricultural purposes, while the pans in which it is collected render large areas of agricultural land unproductive. The disposal of mining wastes into slurry ponds can lead to the seepage of pollutants into groundwater. The process is a slow one, and by the time the pollution becomes evident, the accumulation will have assumed dangerous proportions. Of the two million tons of hazardous waste produced in South Africa every year, the gold mining industry is responsible for one-half. This is only a small portion of the 460 million tons per annum solid

wastes generated (Noble, 1992, p 1).

Ground water can be affected in its quantity and quality by the way in which the soil has been manipulated by humankind to meet his needs. Agricultural practices such as land clearing and overgrazing reduce the permeability of the soil which is then exposed to the ravages of hard rain. Downpours result in overland flows, if not floods, which do not infiltrate into aquifers to recharge the groundwater. A similar result arises, of course, from impermeability caused by urbanisation. Fertilisers, pesticides and herbicides, used in the growing and protection of crops, are transported by surface runoffs into streams, rivers, reservoirs and dams thus reducing the quality of the surface water. The fertilisers, as well as detergents originating in urban areas induces entrophication or overenrichment of the water as a result of high concentrations of phosphates and nitrates. The salinity levels of some South African dams have reached dangerous proportions. The maximum level tolerated by crops like maize, potatoes and fruit is 660 milligrams (of total dissolved solids) per litre. Four and eight out of 13 dams have concentrations higher than this for fifty per cent and ten per cent of the time respectively.

Equally, where human wastes generated in urban areas are dumped into rivers and coastal waters in untreated form, surface waters are polluted with synthetic organic chemicals, heavy metal solutions, pathogens and nutrients. In formal urban settlements these wastes are usually conveyed in effluent form to sewage works where they are treated before being released into rivers and coastal waters. Such facilities do not as a rule exist in squatter camps or similar informal settlements which are located, where possible, and convenient with respect to places of employment, on the banks of rivers, with dire results for the consumers of their contents. A case in point is the Umsinduzi river in Natal's Umgeni catchment area, as evidenced by its effect on the 1991 Duzi river Marathon canoeists, seventy per cent of whom were afflicted with colic (Van der Walt, 1991, p 19). On the banks of this river squatters had been accumulating huge piles of tins, rags, plastic materials and other debris and tossing bucketsful of dirty water down the slopes. Heavy rains washed these pollutants and human faeces from overflowing pit latrines into the river to infest it with E. coli and other bacteria in concentrations greatly in excess of acceptable levels as laid down by the WHO. Arising from the contaminated water are water-borne diseases such as cholera, typhoid and a range of infections responsible for gastro-enteritis, amoebic dysentery and polio (Fair, 1995, p 49). (Rivers in many Third World countries have been likened to large pen sewers (Benneh, in UN, 1994, p 162) and three quarters of the diseases in the LDCs in the ESCAP region could be traced to unsafe drinking water. The US Agency for International Development estimated that world-wide, improvements in water supply and sanitation could bring about the following reductions in the incidence of mortality: from diarrhoea 22%, from roundworm infection 28%, from schistosomiasis 73% (UN 1994, p 32). When, as in some rural areas, contaminated water and fuelwood shortage co-exist, the cost of boiling water to render it safer may become

prohibitive.

Industry and Mining, on their part, introduce synthetic organic chemicals and heavy metals into freshwater as a result of manufacturing processes such as smelting, plating, galvanising and the manufacture of batteries and plastics. It has also been averred that there is a gradual build-up of toxic metals such as cadmium and mercury, the toxicity of which is magnified as they rise through the food chain, with humans as the ultimate consumer (Hamza in UN, 1994, p 154). Toxic material is discharged on occasion into South African streams with disastrous results for fish life. In 1989 it was reported that acid water from old mines in the Witbank (Transvaal) area had been seeping into the Olifantsriver and destroyed aquatic life including crocodiles and fish eagles in sections of it. It had evidently been the result of old mine shafts and tunnels filling up with water from underground sources and becoming polluted with iron, manganese and sulphur. Rising to the surface, the water eventually entered the river (Die Burger, 1989, p 3).

The Department of Environment Affairs (1992) has estimated that apart from 780 000 tons of effluent released annually into rivers and dams in South Africa, 466 400 tons of waste are discharged into our coastal waters and estuaries, consisting of 196 300 tons offshore pollution, 53 000 tons of surfzone pollution, 22 500 tons into estuaries and 194 600 tons of storm water runoff. Some 235 million tons of river sediment runoffs are also carried into the sea, which has received more than a million tons of shipwreck material since the end of the second world war as a result of the foundering of ships. Surface trawls have revealed the presence of some 3 500 fragments of plastic material per square kilometre in our coastal waters, which is still a much lower prevalence than in the middle of the Pacific Ocean. (This relative advantage may arise from the small number of perennial rivers and streams.) However, there was an increase of 190 per cent in plastic pollution from the Kei river to Cape Point during the five years 1984--89 (Anon, 1995, p 1). Of the estuaries around the Southern coast - on which 81 species of fish are dependent during some phase of their life cycles - only 24-28 per cent have been rated as in good condition. Further away from the coast passing ships regularly dispose of their wastes into the sea. And when tankers founder close enough to the coast, beaches and seabirds get covered in oil, necessitating costly clean-up operations. The Koeberg nuclear power station pumps heated water into the sea, creating risks for aquatic life.

While about two-thirds of the world's population are living along the world's coasts, South Africa has only 13 per cent of its population settled thus, as a result of the inland location of the major industrial and mining areas. Accordingly, the stress on coastal waters by human habitation is considerably less than in the rest of the world, in parts of which, such as around the Mediterranean sea, pollution has attained alarming proportions (New Scientist, 1995, pp 26-31).

But this does not mean lesser stress on the seawater around the South African coast in its function as host to an important source of proteins in human diet. On a global scale the marine fish catch has reached its peak in 1989 at 86 million tons. (Inclusion of freshwater harvests raised the aggregate to 100 million tons.) Since then it has been on the decline, after having increased almost fivefold during the four decades 1950 - 1989 (The Economist, 1994, pp 15-16). According to the UN Secretariat (1994, pp 34/5) global harvesting is proceeding at the critical level of 85 per cent of maximum yield, and is exceeding it in some regions, spelling non-sustainability. To maintain catches, smaller fish and species previously ignored are being caught; governments have increased their subsidies to the industry; fishing fleets or harvest capacities have been expanded and fishermen have been venturing ever further away from their bases to tap sources not yet over-exploited. International incidents ensue. The exercise becomes self-defeating.

The abuse of marine life exemplifies the curse of the commonage inflicted upon a limited natural resource to create a reinforcing environmental discontinuity. The produce of the high seas belongs to everybody and therefore to nobody who could otherwise be interested in conservation. The process is illustrated in Figure 7.1 in which the population curve represents numbers at constant consumption *per capita*.

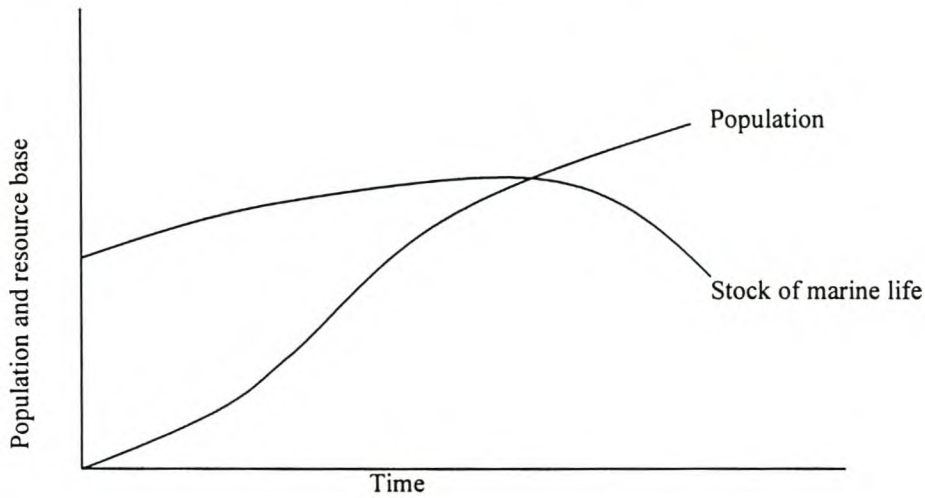
After the point of intersection C, the resource base (the breeding stock) becomes decimated and efforts to maintain *per capita*, or even the aggregate catch, entail further inroads into nature's capital, reducing cumulatively the returns per unit of effort and of future effort. After the global average *per capita* catch had increased from 8 to 18 kilogram between 1950 and 1970 optimistic projections envisioned harvests of up to 200 - 400 million tons annually. By the middle of the 1980's eleven major marine fishery areas had been over-exploited "to the point of collapse" (IFR 1991, p 6-56). The situation has been aptly depicted by Myers (in UN, 1994, p 57): "... environmental discontinuity or a threshold effect of irreversible injury ... occurs when ecosystems have absorbed stresses over long periods without much outward sign of damage and then eventually reach a disruption level at which the cumulative consequences of stress appear in critical proportions".

What with the inclusion of catches off the Namibian coast in South African statistics until 1979 it is unclear to what extent South African marine resources have been over-exploited. Total catches of pelagic fish have been fluctuating from year to year since 1965. After exhibiting a peak of 509 000 tons in 1967, secondary peaks were registered in 1973, 451 000 tons, in 1979, 380 000 tons and in 1989, 403 200 tons - if we ignore the outlier values for anchovies in the year 1987 and 1988 (IFR, 1991, p 6-57). Describing irregular cycles, the slope of the trend curve is slightly downward. At half the 1967 level the 1990 catch reflected the imposition of quotas following upon over-fishing, (at least as perceived by the

authorities). Between 1960 and 1983 the catch per standard boat day declined from 117,5 to 25,7 tons, raising the cost of supply, and reducing the catch per head of the population from 29,6 kilograms per annum during the sixties to 18,4 kilograms in the 1980's (IFR, 1991, p 6-61). Increasing recourse to mussel and oyster farming is supplementing marine production, while inland waters are used increasingly for the production of freshwater fish.

Figure 7.1

ABUSE OF MARINE LIFE



To increase productivity in sea harvesting and thus, presumably, to compensate for declining resource bases as well, resort is had to gill or drift nets. Described as walls of death they constitute a most destructive method of fishing. One estimate has it that up to 40 per cent of the target fish may be killed and/or injured and discarded, while unwanted non-target species are also killed (The Dolphin Action and Protection Group, 1991, p 1). While these nets have been outlawed by South Africa, they may still adversely affect this country's sea harvest in light of the fact that foreign fishermen have been arrested and fined for using gill (or drift) nets, some more than 20 kilometres long, off the South African coast.

7.6 LAND

7.6.1 Land Use

There is some discrepancy between two sources of data with regard to the total surface area of South Africa to be apportioned among the various uses to which it is put. The pattern of land use in Table 7.4 is an adaptation of the President Council's data (1991, pp 13-14, total area 107 million hectares) to those of World Resources (1992, pp 262-263), 122 million hectares).

TABLE 7.4
LAND IN USE IN SOUTH AFRICA

	Million hectares	%
Residential and industrial areas	6,0	4,9
Roads and Railways	2,1	1,7
Mining	1,1	0,9
Parks, forests, woodlands	6,2	5,1
Cropland	13,1	10,7
Permanent pasture	81,0	66,4
Other	12,5	10,3
	122,0	100,0

Inasmuch as humankind needs living space in the form of residential accommodation, there is an obvious and direct link between population size and growth and land appropriated for residential structures (houses, cottages, hovels). While affluence may make for larger *per capita* sites being occupied in the suburbs, the vertical construction within towns and cities may act in compensating manner. Poverty is more likely to be associated with space-demanding horizontal construction, particularly when it leads to squatting and land invasions. In the latter event they could occupy land better suited to the production of vegetables, as on the Cape Flats, or they become such a nuisance to owners of adjacent vegetable growers as a result of repeated thieving that the latter have to resort to shooting at the thieves and/or abandoning their farms (Peacock, 1995, p 6). The aesthetically objectionable squatter camps constitutes no more than survival accommodation in which environmental conservation is not esteemed. Open spaces between shacks, or planned open spaces in informal settlements, become recipients of human wastes. The landfills on the edges of formal settlements have the same function and a similar effect on the land.

The apportionment of 4,9 per cent of land use to Residential and Industrial Areas does not adequately measure the significance of man's encroachment on the land, since much better than average quality areas are involved, and requiring the costly infrastructure of urban living, as well as the means of communication between settlements: roads, railways, bridges, telephones.

Of more importance than the need for living space are the demands upon land for the purposes of producing the food requirements of the population: directly, by providing all the ingredients of the diet or, indirectly, by producing exportables, the foreign exchange earnings of which can be used to buy the necessary imports. The less the level of development of the industrial sector and the greater the desire for self-sufficiency in food supplies, the greater are the demands upon land and nature.

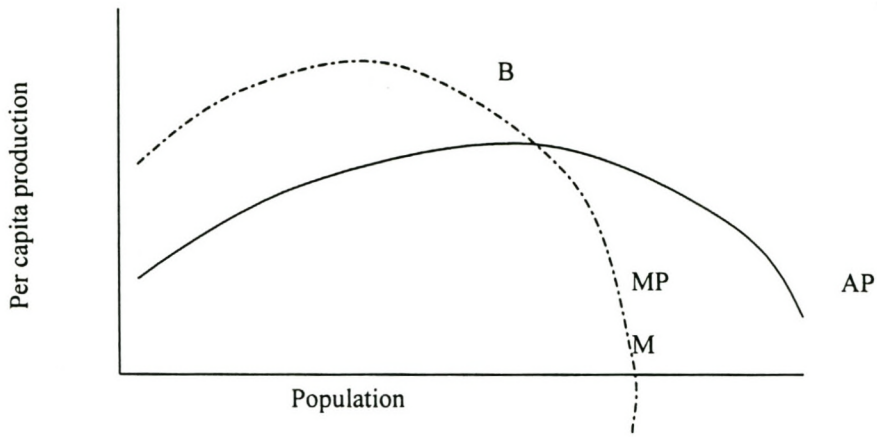
More than three-quarters of the South African surface area is being used for agricultural purposes, encompassing 10,7 per cent cropland and 66,4 per cent permanent pasture (1 per cent of the latter as cultivated pasture). Of the latter, 10 per cent is of high, 30 per cent of reasonable and 60 per cent of poor quality. Of the 31,1 million hectares of cropland some 9 per cent (1,2 million hectare, responsible for 25 - 30 per cent of agriculture production) is under irrigation, with meagre prospects of an extension except in the former Homelands (which are also the Homelands of subsistence agriculture), extension being thwarted by the competing demand for water by expanding industry and population in addition to the silting process. Between 1936 and 1996 the *per capita* agriculture land shrank from 9,4 hectare to 2,24, and by the year 2011, when population is projected to grow to 53 854 000 compared to 42 052 000 in 1996, the figure could be 1,7 hectare. The comparable figures for cropland are 1,3 (1936), 0,31 (1996) and 0,24 (2011) hectares respectively. Which means that to maintain production *per capita* the productivity per unit of agricultural land has to be raised by 29 per cent over the fifteen year period 1996 - 2011.

7.6.2 Pressure of population on land

To simulate the pressure of population on land we can have recourse to some data pertaining to the system of traditional (subsistence) farming in the Homelands where land - "synonymous with womb" according to a spokesman for the traditionalists - is perceived as the unique co-operant factor of production: witness the "land hunger". Except for the development inputs by government, dependence upon nature is almost complete in the absence of a *pari passu* accumulation of man--made capital and technology. Capital formation insofar as it does occur, mostly assumes the form of increases in quantities of livestock, quality constant, which is dependent upon the carrying capacity of grazing-land, nature, that is. The situation can be diagrammed as in Figure 7.2. It is not to be inferred that the available land was available to every family. The Homelands surface area was extended by only 11 per cent since 1951 while the population expanded by 336 per cent. This did not allow for an unlimited subdivision to give every family a stake in the land, leaving increasing numbers landless. But dividing the available land area by the total population yields a *per capita* average of 0,86 hectare in 1991 (5,2 hectare per family) compared to 6,17 in 1911 (37 hectare per family), and when the averages are based on cropland only, the figures have to be divided by 7.

Figure 7.2

PER CAPITA RETURNS ON CONSTANT LAND AREA



When, at the beginning of the century, limited supplies of human factors of production (highly or perfectly correlated with population) were applied to the given land area an increase in these amounts could possibly have raised the returns *per capita*, as represented by the marginal and average product curves up to point B, spelling increasing returns to scale. Thereafter, as population increased, and land and grazing rights were being allotted to them - by headmen and chieftains as trustees - the production generated by the additions to the human factors - the marginal product - declined, to be followed by a diminution in the average product as well. With numbers proliferating, a stage can be reached when not only the average, but also the total, product may diminish in the absence of rescue operations, as indicated by the stage beyond point M on the curve, when marginal returns become negative. The situation is analogous to that at point C in Figure 7.1. Land, which permitted the enjoyment of subsistence affluence (as explained in Chapter 5.2.2) up to the 1920's, obliged ever increasing numbers of inhabitants to seek economic refuge in the migrant and commuter labour system, which, together with government rehabilitation and aid projects, relieved some pressure on nature. In 1955 the Tomlinson Commission (1955, p 99) reported that the net income produced by the traditional economy (at constant prices) remained almost constant over the period 1936 - 1951, which meant a decline in *per capita* income. This latter magnitude, in index form, diminished from 100 in 1946 to 61 in 1960 and 54 in 1970 (Sadie, 1978, p 19). In one location which was surveyed in 1937 and again in 1969 it was found that the agricultural yield per person had dropped, between the two dates, from 2 bags of grain and beans to 0,4 bag (Hattingh, 1970). If it is true that this was the outcome, in part, of an increasing orientation towards competing opportunities in the labour market outside the Homelands, and therefore of the neglect of agriculture, it is also true that the diminishing size of plots rendered the optimum exploitation of their capacity an exercise that was not worth while.

Food crops suffered as a result of the destruction of trees and shrubs to satisfy fuelwood needs, since harvest residues and cattle dung served as substitute fuel, instead of being used for compost purposes. But it is particularly as livestock owners whose increasing numbers, "without personal or communal responsibility for the maintenance of soil fertility or of the carrying capacity of the grazing ... robbed the soil" (Tomlinson Commission, 1955, p 74) that subsistence farmers have been damaging the environment and its ability to provide sustainable levels of living. Almost inevitable is overgrazing, a stripping of the vegetation cover and the degradation of the land. The nature-engendered capital is decimated. It is conceivable that, where at least flatlands are involved, a cyclic process could ensue if the decimation is sufficient to oblige of a regeneration of the vegetation. On the escarpments a permanent loss of soil fertility is more likely. In an Expert Group Meeting on Population, Environment and Development in January 1992 (UN, 1992, pp 7/8), poverty was proffered as a cause of land degradation "most notably - apart from population growth - since impoverished people could not afford the conservation measures needed to protect soil

cover". This dichotomy in imputation has the flavour of otioseness, in that the shrinking acreage per person - in the present context at least - defines impoverishment, and the meagre amount of assets, confined to natural and nature-engendered resources, is poverty.

However, subsistence farming is practised on less than one-sixth of South Africa's agricultural land, and commercial farming is no less responsible for land degradation. A 1991 survey of the South African Agricultural Extension Service found that 19,2 per cent of cattle farmers overestimated the long run grazing capacity of their farms by 6 to 25 per cent, 18,1 per cent by 26 to 50 per cent and 24,1 per cent by more than 50 per cent. Comparable proportions for sheep farmers were 11,5, 11,1 and 18,5 per cent respectively (Die Burger, 1991). This overestimation spells overstocking, which removes the, or some, indigenous vegetation cover, exposing the bared soil to the erosive force of raindrops and wind and leaving behind parent soil which has lost its water-retention capacity, and is much poorer in nutrients than the eroded material - one-third to one-fifth of the latter (Scotney & Dijkhuis, 1990, p 397). South Africa has been losing approximately 300 tons of topsoil through erosion every year, that is, at a rate of 3 tons per hectare, which is ten times that of soil formation. This would have deprived the country of a quarter of its original soil reserves (Soutter, 1988, p 11). The Department of Water Affairs suggested that the observed reduction in deposits of eroded soil into the South African rivers could reflect a diminution of the soil left to be eroded (Waterwese, 1986, pp 38/9). To compensate for the loss of soil fertility thus brought about would need an annual fertiliser application costing more than one billion Rand (Soutter, 1988, p 11).

For Africa as a whole the percentages of human-induced degraded soil, at three levels of intensity, have been estimated at 8 per cent slight, 9 per cent moderate and 6 per cent severe (World Resources, 1992-93, p 290).

Even in the absence of erosion the continuous use of land can cause deterioration. Fertile soils are rich in organic matter of which nitrogen is an important element, and while soils devoid of organic matter can still achieve reasonable yields, more costly compensating inputs are required. Studies in the USA and Canada suggest losses of 40-45 per cent of organic matter to result from long term cultivation, while the rate of deterioration could be higher in Southern Africa (Scotney & Dijkhuis, 1990, p 396). The process starts immediately after virgin soil has been broken up.

When the cultivated area is extended by encroachment upon rain forest environments the process takes place at a much more destructive pace. The forests' nutrients are not stored in the soil but in the biomass, and are lost when the tree and plant cover is removed. This fragile soil may produce respectable yields for a year or two, after which they fall off drastically when the nutrients have been used up. Only shifting cultivation on the basis of 20-30 years'

fallow periods is feasible, and population pressure does not permit of it, nor of adequate fallow periods for other croplands, the marginal proportions of which are ever extended by the poorest communities. When this extension encroaches upon nature reserves, water resources and eco-tourism can be the losers.

To the degradation caused by rain and wind must be added physical degradation, which is waterlogging, compaction and subsidence of organic soils, and chemical degradation associated with salination, acidification and pollution arising from the intensification of land use in attempts to compensate for limitations imposed by its size.

All the problems narrated above are exacerbated by recurring droughts which stretch the endurance of natural resources beyond the limit. Farmers tend to be optimistic and stock their land in accordance with its perceived carrying capacity during good years, thus initiating or hastening a process of desertification when droughts lasting three or more years occur, which process has been defined as "the diminution or destruction of the biological potential of the land, which ultimately leads to desert-like conditions" (Thiam in UN, 1994, p 175). The President's Council maintained that 55 per cent of the total surface area of South Africa was threatened with desertification including "the entire Karoo (36,2%), sensitive areas (10,9%) and a transitional area of some 31 million hectares (8,5%)" (1991, p 16). It is claimed that the Karoo system is insidiously creeping northwards. The people driven off their land by the conditions portrayed above and seeking refuge elsewhere have been dubbed environmental or eco-refugees. There may be 12 million of them in Sub-Saharan Africa (Myers, 1994, p 7), displaced within, and across, their own countries' borders. It is difficult to know how many of the refugees in South Africa would qualify for this label.

7.6.3 Food Supplies

Without any doubt the rain-fed lands of the earth can, in concert with the necessary technology, capital and entrepreneurial initiative, produce enough food to provide the world's population now, and in the foreseeable future, with an adequate diet. The FAO, in co-operation with the International Institute of Applied Analysis estimated the potential population-supporting capacity (PPSC) of 117 LDCs taking into consideration the soil productivity, rainfall, climatic variability, natural erosion and the *per capita* energy and protein requirements of each, while distinguishing three levels of agronomic inputs: I. Low level, with no fertiliser, pesticide application, improved strains of crop material, soil conservation measures or mechanisation; II. Intermediate level, in between the low and the III High level which assumes full mechanisation, optimum amounts of fertiliser, pesticides, genetic material and soil conservation plus the most nutritious crops (FAO in UN, 1994, p 256, Higgins *et al.*, 1982). It was found that by the year 2000 64 of the countries would not be able to produce enough to meet their food needs under level I conditions, typical of

subsistence farming in Sub-Saharan Africa, where 26 countries out of 46 were unlikely to sustain their populations. Some 14 of them could not have met the requirements of their 1975 population even. The PPSC of Africa as a whole, expressed as a multiple of their projected 2000 population, came to 1,6, signifying that within two decades after the turn of the century the productive capacity of the region would be overhauled by their population size. The multiple rises to 16,5 if agricultural practices were consistent with the level III technological inputs (World Resources, 1986, p 46).

Operation at the third, or even the intermediate level, makes the following demands upon practitioners: Knowledge of the ways and means of raising productivity; initiative to engage upon the mode of production involved; financial means to purchase and afford the required inputs; using the land to earn a living and not as a way of life; adequate acreage to sustain a family, which means that increases in population numbers should not be allowed to overcrowd agricultural land, but, instead, be economically accommodated in non-agricultural pursuits. In predominantly agrarian societies and traditionalist agriculture these conditions are, for the most part, not satisfied. Accordingly, whatever the PPSC of the earth may be - and Gillis *et al.* (1992, p 49) believe that the planet is not remotely close to the biological limit - there is still a non-coincidence of the location of people and food supplies at the level of individual communities. That the problem is thus one of distribution does not necessarily render it more easily resolvable than any other problem of Third World countries.

Barring international food aid and gifts from the food-surplus to the food-deficit countries, the latter still have to afford the requisite imports, which, invariably - a few industrialised countries aside - they can not, since they are also manufactures-deficit countries. Of the 26 sub-Saharan African (SSA) countries unable to feed their projected populations of the year 2000, only 6 have the ability to afford food imports by means of the exportation of manufactures and fuel minerals (FAO, 1984). During years of favourable weather conditions in the deficit countries, the "marginal" imports of food involved can still be handled with reasonable facility. However, when severe droughts are experienced, the transportation and distributional networks of these countries tend to be inadequate to pre-empt famine. The larger the population the greater the vulnerability to natural disasters.

This vulnerability is also the more acute the greater the dependence on natural resources as reflected by the share of agriculture in the generation of the GDP or GNP, and the percentage of the labour force engaged in it.

Given the land area and the level of non-labour inputs, the inverse correlation between population size and food production *per capita* is close to unity.

The rapid growth of the SSA population changed the region from a food exporter to an

importer of considerable volumes of food. In 1995 the Worldwatch Institute reported that populous China became a net importer of grain; but opinions differed about whether it presaged a long-term situation (Briscoe, 1995, p 8). Brown and Kane, reassessing the earth's population carrying capacity projected the grain production of the four largest food-producing countries to the year 2030. While the USA will show a surplus of 83 million tons, the other three will experience deficits of 25 million tons (the former Soviet Union), of 45 million tons (India) and of 216 million tons (China). In addition nine other countries with large populations will not be able to satisfy their own needs (1995, pp 6/7). In South Africa the *per capita* food production has been declining since the middle of the 1970s (by 9 per cent during the period 1977-1989), concomitantly with a 1,3 per cent decrease in cropland and an increase of 34 per cent in the population, and the trend seemed likely to continue (IFR, 1993, pp 5-10/11). Whether the country is able to feed itself at existing levels of consumption depends very much on weather conditions in the summer rainfall area where the maize crop can vary from 4 to 14 million tons. Severe droughts compel the importation of maize, wheat, meat and dairy products.

The levels and growth of production in the food surplus and self-sufficient countries have been achieved by exacting high and increasing yields per hectare, requiring the technologically most advanced Level III inputs (to be discussed in the next Chapter), which are destructive of environmental integrity which, in turn, can have a rebound effect on agricultural productivity. Myers (in UN, 1994, p 55) has estimated the covert cost involved at almost half the gains in production achieved by means of increased hi-tech inputs. Over the period 1955 - 2010 soil erosion alone, in this case evidently regardless of level of inputs - could be responsible for a (gross) reduction in food production of 19 to 29 per cent from rain-fed croplands (UN, 1994, p 7). While the world's production of grain is increasing at a rate of less than 1 per cent per annum, its population is growing by 1,8 per cent per annum (2,1% in LDCs), millions of them already in need of an enhancement in diet to combat, or reduce, the incidence of malnutrition. The proportion of people in SSA expected to have less than 1 520 calories at their disposal by the end of the century was estimated at some 29 per cent (UN, 1990, p 251).

7.7 APPORTIONING RESPONSIBILITY

At various stages of the discussion above the role of population in the environmental drama has been touched upon, but apportioning relative significance, at the global, or aggregate, level to the probable determinants of consumption of natural resources is problematical, since the damage inflicted upon them is manifested in many ways, stemming from a diversity of economic activities. In their attempts at imputation writers tend to resort to the First World/Third World (or Developed/Developing countries) dichotomy, the former representing predominantly the affluence factor and the latter the influence of population size and growth.

When the matter is raised at international conferences a preference is shown for highlighting the pollution caused by the former. The discussion at the 1992 Rio Earth Summit constrained one writer to declare that "population hardly made it into the agenda - and as soon as it did it was promptly knocked off again by a combination of the Vatican and its allies" (Myers, 1993, p 31). However, in the papers submitted at the Expert Group Meeting preparatory to the International Conference on Population and Development two years later the demographic factor was accorded adequate exposure.

The affluence factor is being associated with dietary and technological richness, usually with an accusatory slant to it. "Always I end up with the same conclusion" asseverated the president of the People-Centred Development Forum uncompromisingly, "it is the ever growing demand of the wealthy for more and more resources that depletes our environment and pushes the poor to ever greater social and ecological desperation" (The Hunger Project, 1991, p 2). The Economic Commission for Latin America and the Caribbean (ECLAC) would have it that economic development "and the demand of the consumption patterns of developed countries and developed sectors of developing countries are largely responsible for the environmental degradation which has taken place throughout the world" (in UN, 1994, p 235). The rich diets and high levels of living of the Developed World make greater demands *per capita* upon the earth's potential to deliver. While 50 litres of water per person per day would provide a reasonable quality of life, the United States' figure approximates 500 litres, and that of India 25 litres (Crews, 1987, p 3). While a daily intake of 2 400 calories per average person would suffice for well-being, First World persons average 3 300 calories compared to 2 200 in the LDCs. Proteins derived from the ingestion of red meat require seven-and-a-half times as much grain as a vegetarian diet. If the more than one billion Chinese were to seek their protein requirements from meat instead of from the consumption of soy, the hundreds of millions of animals entailed would devastate their economy (The Hunger Project, 1987, p 3). According to the Hunger Project the earth could support 5,5 billion people assuming vegetarian diets, current bio-technology and all lands devoted to the production of food only. A Western European and American diet, by comparison, with a 25 per cent animal protein content, brings down the number to 2,8 billion (Myers in UN, 1994, p 56). To this can be added that the developed countries have a greater capacity to abuse the global commons - the oceans - and do, in fact, inflict greater damage upon the marine breeding stock than the developing countries (LDCs) when catches in their own coastal waters shrink.

It is however, particularly in the realm of the mode of production, in combination with their way of life, that the higher income countries are called to account for their despoliation and consumption of natural resources. North Americans use energy at the rate of 45 barrels of oil equivalent per person per annum, compared to 2 in Africa. The US, the European Union and Japan are responsible for 40 per cent of the world's carbon dioxide emissions by burning

fossil fuels (Pearce, 1995, p 4). (As pointed out in the discussion of the greenhouse gases, this is only half the story.) The demographic centre of ECLAC, quoting the UN Population Fund as their source of information, claims that "although they account for scarcely 25 per cent of the world population, the developed countries consume 75 per cent of all energy produced, 79 per cent of the fuels that are marketed, 85 per cent of articles made of wood and 72 per cent of the steel produced". We have on the one hand a statement that in the matter of global warming and ozone layer depletion the ways of the 1,2 billion Northerners are more damaging than those of the 4,3 billion Southerners (Toeba, *et al.*, 1992). On the other hand Harrison argues that the reduction in population growth, by virtue of its share in deforestation, can make a dramatic contribution to the slowing down of global warming (1994, pp 8/9).

The argumentation would be incomplete if mention is not made of the Malthusian thesis. Thomas R Malthus (1798) - arguably the father of demography - laid unique stress on population which would tend to outrun food supplies unless restrained by preventive checks. He wrote his Essay before the industrial revolution had raised living standards of significant proportions of populations. However, preceding the report to the Club of Rome by Meadows, *et al.* (1972), Forrester's model-building led him to the conclusion that the Malthusian principle was in action all the time (1971).

Our quest, formulated at the beginning of this section might meet with success if we could give quantitative content to all three factors on the right-hand side of the identity (Ehrlich & Ehrlich, 1990, Commoner 1990) which defines the environmental impact (I) as

$$I = PAT$$

where P represents population numbers (N, for numbers, in this author's notation), A, affluence ($Y_{p.c.}$ or income per capita) and T, technology. As it stands the identity should furnish us with the point of time intensity of impact, the influence of anyone of the three determinants being compounded by the level of the other two. To distinguish between the significance of the three we have to have recourse to the time derivatives or rates of change, indicated here by small letters:

$$i = p + a + t$$

[or for a specific time period $I + \Delta I = (P + \Delta P) \times (A + \Delta A) \times (T + \Delta T)$]

Commoner (in UN, 1994,, pp 64-77) quantifies the magnitudes involved to test for the distinct significance of each of the three determinants in the pollution represented by carbon monoxide and nitrogen oxide emissions, pesticide usage and nitrogen fertilizer as experienced in 10 to 18 selected developed countries. Denying functionality to the Pollution/Population

relationship ("This is evident from the mathematics of the PAT equation", p 76) he comes to the conclusion that "... the technology of production ... is the major determinant that governs the impact of population and economic development on the environment" (p 76). Unqualified, such conclusion has too wide a range of meaning for the narrowness of its base.

Instead of this identity use can be made of the functional relationship specified at the start of this Chapter viz.

$$C = f(N, Y, Y_{dist.}, P).$$

Technology is not included in this equation since it is considered to be the means whereby the desire for higher income was turned into reality, and being, therefore, a function of Y, it would introduce multicollinearity. It assumes the character of a proximate determinant while the others are of an ultimate nature. When governments step in to check the consumption (C) of natural resources, when the most advanced stage of technology and of living standards has been reached, technology enters as an element in the constraint variable P (price and/or policy, not population which is represented by N) which will have a negative sign.

Differentiating with respect to time, and omitting $Y_{distr.}$, which cannot be handled in the same manner as the other variables, we have

$$c = e_n r_n + e_y r_y - e_p r_p$$

with the e values referring to the elasticities with respect to population, income and price respectively, and r standing for the rates of increase or decrease. In a practical example the use of the relationship can be illustrated in which $e_p r_p$ is neglected but $Y_{distr.}$ is brought into play. For the purposes of our exercise the South African population is divided into four income groups whose numbers are projected from 1991 to 2001 to yield r_n for each group; and the r_y values are probabilistic estimates subject to the constraint that the aggregate value should be zero, the assumption being that the economy will grow no faster than population numbers. This does not prevent some groups from improving their economic position. Though the population elasticity of consumption is influenced by the age structure, and ageing is positively associated with income *per capita* in our example, it will be premised that e_n will not deviate meaningfully from 1,0 (for all income groups). The e_y values have been based on a cross-reference of income per ethnic group, social accounting matrix data, and income elasticities per ethnic group for the various items of household expenditure on non-essentials (or "prosperity" goods). (Eckert & Mullins, 1989; Whiteford & McGrath, 1994; Loubser, 1990, p 20.)

TABLE 7.5(a)

INPUTS IN THE CONSUMPTION EQUATION

Group	Population			Income per capita			
	1991 %	2001 %	r_n	1991 R	2001 R	r_y	e_y
Rich (A)	10,8	9,6	0,8	25 940	26 450	0,3	1,0
Middle Income (B)	39,6	38,5	1,7	5 490	6 070	1,1	1,1
Poor (C)	22,0	22,8	2,3	2 250	2 510	1,2	1,3
Very Poor (D)	27,6	29,1	2,5	920	920	0,0	1,3
Aggregate	100,0	100,0	2,0	5 725	5 725	0,0	

TABLE 7.5 (b)

1991-2001 CONSUMPTION OF NATURAL RESOURCES PER ANNUM

			Weighted		
	$e_n r_n$ +	$e_y r_y$	$e_n r_n$	$e_y r_y$	Aggregate
A	0,8	0,30	0,086	0,147	0,233
B	1,7	1,21	0,673	0,460	1,133
C	2,3	1,56	0,506	0,136	0,642
D	2,5	0,0	0,690	0,0	0,690
	2,0	0,0	1,955	0,743	2,698

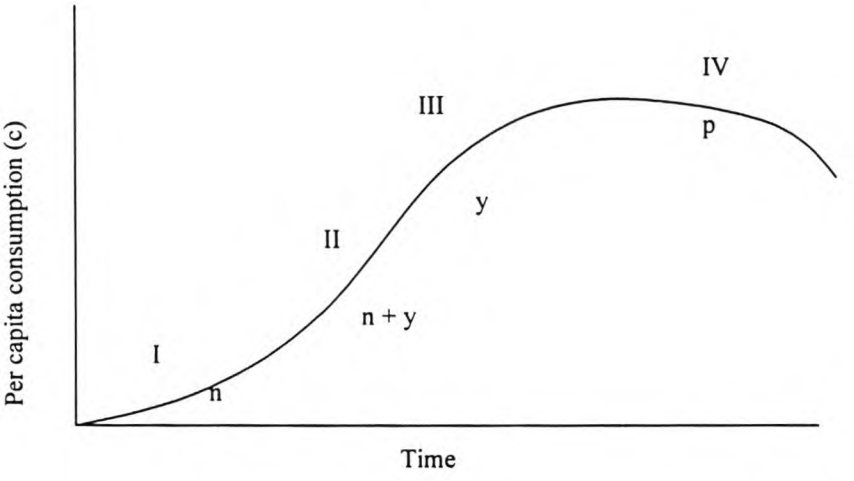
To determine the contributions of each income group (the horizontal aggregate) $e_n r_n$ values were weighted with relative population numbers, and $e_y r_y$ with the relative shares in the total personal income.

The statistical exercise presented in Table 7.5 suggests that natural resources are being consumed at a rate of 2,7 per cent per annum, of which population growth would be responsible for 2,0 per cent, which is 2,6 times the rate arising from the income factor. If the latter had been judged by the presumed aggregate no-change in the *per capita* average, its contribution would have been zero. However, the presumed (probable) redistribution towards the higher income groups, average constant, is responsible for according it a positive value of 0,743 per cent per annum. (This seemingly statistical oddity which would indicate that groups A, B and C will be better off and group D not worse off in 2001 than in 1991, while the *per capita* amount in the aggregate remains constant, is purely a function of the relative numbers receiving incomes below and above the average and of the distribution, among the groups, of the expansion in the absolute amount of the GDP.) If the total increment in personal income, 1991-2001, is for the account of the very poor, groups A, B and C not gaining in income *per capita*, the rate of natural resource consumption increases slightly to 2,8 per cent (by way of the influence of $e_y r_y$), and group D would then be the chief contributor while in the above exercise the middle income group emerges as the major performer. Naturally, the higher the

increase in the rate of *per capita* income growth, the greater will be the influence of the affluence factor.

The course of natural resource depletion in terms of n, y and p at the generalised, or aggregate level, can be traced by stylising it in the sigmoid curve (Figure 7.3) as a community progresses on the development path. At the undeveloped phase I, with only natural resources in productive co-operation, n is the unique determinant.

Figure 7.3 **NATURAL RESOURCE DEPLETION**



In phase II, aspiring to higher standards of living, entrepreneurs emerge and invest in technology and capital (man-made), to add y to n as depleting forces. If this coincides with the explosive phase of the demographic cycle, the effect of n is enhanced. Depletion is occurring at an accelerating rate. When economic development has attained a level of maturity producing high average incomes *per capita*, consciousness about the despoliation of nature is awakened and government is exhorted to combat it, the taxpayers now able to finance such action represented by p. The latter can take the form of pricing, a system of quotas, the internalisation of external costs and/or compulsory adjustments to technologies in use. Marginal private cost, which is raised by government intervention (in the case of oil by cartel intervention), is brought closer to marginal social cost. The effect of y is attenuated, n might at this stage approximate zero, and p emerges as the predominant force. The asymptotic phase III portion of the sigmoid curve has been reached, which can end up with a downward slope if measures are vigorously applied (phase IV).

The sequence of predominating forces is, therefore, successively n, n + y, y, p.

Commoner's (1994) statistical exercises pertain to phase III and IV in which n has become insignificant, in terms of natural increase, and the level of Y, and therefore of y, is not an important obstacle, so that p is the logical object to which attention is to be devoted. However, the juxtaposition exemplified in his statement that the 41,8 per cent reduction in CO emissions, accomplished by the catalytic converter in car exhausts in the US during 1970-87, could only be equalled by a 51 per cent decline in vehicle/kilometres *per capita* or a 60 per cent diminution of population, is less than apposite. Reducing population (N) is not an option, only n is, and in the circumstances in which his model is operating, restraining y, insofar as it is implied in policy measures, is not a major problem. Nevertheless, directing attention to alternative or new technology has the merit of avoiding a direct attack upon the level of Y which has little chance of meeting with acceptance or acquiescence.

Obliging the installation of pollution-inhibiting mechanisms, like the catalytic converter, represents one version of the internalisation of costs. The other is a direct attack upon the price mechanism by taxing the guilty parties by means, for example, of a carbon tax. The reasoning is that the unimpeded market is not geared to reflect externalities and to anticipate supply conditions a decade or longer ahead, so that prices will be too low to induce the optimal use of particularly non-renewable resources. If, in addition, e_p has a low value, the market, left to itself, will fail to effect the desired restraint.

In this regard Birdsall (in UN, 1994, p 49/50) presents an example of the comparative costs of effecting a 10 per cent reduction in carbon emissions by means of (i) a carbon tax, or (ii) a family planning programme (FPP). Assuming the cost of averting a birth to be 220 US dollars, she finds that per ton of carbon emissions avoided, the cost of the FPP, at between 4 and 11 dollars, compares favourably with the 20 dollar marginal cost of the tax.

UNCTAD has proposed the establishment of a special institution through which the price mechanism could fulfil its role. The US, Japan and the European Union, which are required to reduce their carbon emissions to the 1990 levels by the year 2000 under the climate change convention, should set up a pollution exchange to allow pollution entitlements to be traded, the parties guilty of exceeding their entitlements buying permits from the innocent or pollution-preventing companies (Pearce, 1995, p 4).

It is, of course, possible for the price mechanism to act perversely in terms of conservation. In the absence of government intervention, rising prices of fish, for instance, due to increasing scarcity, are quite likely to act as an incentive to suppliers (fishing companies) to deplete still further the breeding stocks since the price elasticity of demand is unlikely to be high enough to reduce demand significantly. Physical controls become unavoidable. However, the quotas involved could still be subjected to the price mechanism by putting them out to tender; a procedure which, again, will have the small individual commercial fishermen up in arms.

While the price mechanism can be the appropriate tool for curbing natural resource depletion where it stems from the generation of affluence, it would hardly be contemplated where shortages of life's essentials are the problem. In some MDCs the policy of subsidising farmers does seem to be the antithesis of appropriate action, since it stimulates production - the unsold portions of which are put in storage - and in the process induces the consumption of more of the earth's non-renewable resources than would otherwise have occurred. And the blame could no doubt be laid at the door of avarice, or the maintenance of comfortable living standards. At the same time it is to be considered that it has the role of supplying food-deficit countries, and preventing deaths on a large scale caused by frequently recurring droughts in the latter. And so we have a compounded effect: in the LDCs, as a result of their populations outstripping the carrying capacity of their natural resources, the environment is being abused, while the MDCs, in relieving the resulting shortages, are equally responsible for natural resource depletion.

By virtue of the higher average value of the income elasticity of consumption compared to the population elasticity, each increment in Y should have a greater effect on the environment than a similar relative increment in N. Theoretically, this suggests that income *per capita*, and accordingly economic growth, is a potential candidate for restraint, and the logical question is then whether this is a feasible policy for South Africa, as for the large majority of the world's population. The response must unqualifiedly be in the negative. According to Table 7.4 almost one half of the South African population is either poor or very poor, many of them living in squatter camps and shanty towns amidst squalor, malnutrition or hunger and generally distressing circumstances. Their material standards are not to be maintained only, but raised. While this is not true of the rich and middle income groups, many of the latter still aspire to higher standards of living. And rising incomes for them - as in the case of the MDCs *vis-à-vis* the LDCs - facilitates the continuation of the redistribution of income to the poor and very poor. Stagnating incomes will intensify the burden of taxation for the higher income - but particularly middle income - classes, since the poorer groups are growing faster in number, and this will engender increasing resistance to taxation.

While the poor cannot afford the destruction of natural resources if they have to prevent further impoverishment, they cannot afford to conserve them either, so that poverty, originating in population growth, becomes a major source of inevitable resource depletion, population numbers increasing as they do. When it means malnutrition or, worse still, hunger, we have apathetic human beings concerned about material needs only and lacking in consideration for the environment or the conservation of natural resources. A reasonable degree of material well-being is required for conservation. The Hunger Project (1988, p 1), referring to most Asian countries, stated categorically that "environmental protection simply costs too much". There is here a type of catch 22 situation: the prevention of poverty-induced

destruction requires economic growth which entails affluence- or income-induced depletion. The latter, however, has the advantage of permitting conservation activities. If despoliation of the environment cannot but occur it should preferably arise from economic development which results in reasonable standards of living. When this has been achieved it becomes possible to combat the consumption of the environment by internalising the cost involved or having taxpayers in general bear the cost of conservation. As it is, the proliferating poor will want to move on to the acceleration portion of the sigmoid curve of natural resource consumption, whether by means of self-development or income redistribution. If it were to be accomplished via the former process they can be expected to use the existing environment-depleting technologies for their purpose, and if via the latter process, they will reduce the ability of the higher income classes to combat depletion.

As to the developed communities of the world, it is scarcely conceivable that they would contemplate a deliberate termination of economic growth and development. Their economies are, in any case, not geared to handling such a situation without incurring unacceptable unemployment levels and retrogression. It would also seem to be unnecessary in that new emerging technologies seem to be able to keep the development "green" and to economise on natural resources.

In the post-war course of events in South Africa the affluence factor has been the major source of natural resource consumption up to 1976. Since then population growth has been the major actor. Between 1981 and 1994 the per capita GDP has dwindled by 18 per cent, or R1 516 at 1990 prices, yielding the following values for the two variables in Table 7.4.

$$e_n r_n = 2{,}3\% \text{ p.a.}$$
$$e_y r_y = -1{,}9\% \text{ p.a.}$$

Barring new pollution-exacerbating technologies, population stands out as the villain of the piece. It is the much more compelling force in that even if there is no increase in average levels of living, population growth would still demand economic growth in the aggregate to prevent impoverishment below subsistence levels.

7.8 CONCLUSION

The inevitable conclusion follows: population growth is the force to be counteracted.

It is claimed, with theoretically unimpeachable logic, that "development is the best pill".

Poverty begets poverty and children. The development referred to entails the breaking down

of fertility-promoting traditions by way of education; literacy; a rational approach to life; the emancipation of women and increasing participation in the modern sector labour force which competes with their traditional function of housewife; the emergence of children as a social burden in the urban environment; the breakdown of the extended family system, coupled with rising aspirations towards higher material living standards, which render children an economic burden instead of a real or imagined economic asset. The required development involves an acceleration of economic activity and Y. In terms of the onslaught on natural resources it implies increasing resource-consuming economic growth to reduce resource-destroying population growth. This underscores the catch 22 situation already mentioned above. Of greater importance still is the fact that rapid population growth - as will be demonstrated in the Chapters to follow - is an obstacle to development. Among the communities in question proliferating numbers inhibit the development purported to be the prerequisite for the pill to fulfil its function.

Therefore, a direct attack upon proliferation, even while wrapping it in politically correct verbiage, is indicated; focussing on birth control by persuading couples of the iniquity of improvident parenthood. Declaring that couples shall have the right to decide for themselves how few or how many children they would like to have - beloved of international conferences - has a pleasant, persuasive and moralistically correct sound about it. But it can also be said to be tantamount to asserting that they have the right to promote the depletion of natural resources, and to exact restitution for their improvidence from the practitioners of responsible parenthood.

Whatever theoretical truth may inhere in the slogan: development is the best pill, reality demands that, in South Africa, as in most of the LDCs, policy, for practical purposes, be founded in the inverse: the pill is the best development.

Paul Harrison's statistical analysis leads him to the conclusion that "the figures knock on the head of the old theory that economic growth is the best contraceptive" (1994, p 8). Having analysed the data furnished by the World Fertility Survey (WFS) Robey et.al. disputed "the notion that development is the best contraceptive" (1993, p 34); while Brackett et.al. maintained that the "WFS data on women who want no more children do not support the classical theories about socio-economic determinants of fertility" (1978, p 317). And the president of the International Parenthood Federation stressed that the Programme of Action agreed upon at the 1994 Cairo International Conference on Population (CIPD) "should not be taken as a de-emphasising of the importance of fertility reduction activities" (Sai, 1997, p 4).

The government of the New South Africa, however, in its White Paper on a Population Policy

(Republic of South Africa, 1998), not only de-emphasised it but deliberately and assiduously fought shy of the words 'family planning' except in one bracketed aside ("such as family planning"), and as a peg to hang on a disparagement of the reasonably successful Population Development Programme of the previous government in which fertility reduction featured prominently. It may be a politically correct social agenda but not an economically and demographically inspired population policy to grapple with the problem of natural resource consumption at its roots. It avoids a direct attack on forces inimical to the realisation of the guarantee, in the constitution, (to the present and future generation) of a protected and clean environment.

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CHAPTER 8

TECHNOLOGY

8.1 GENERAL

In the previous Chapter technology has already featured quite prominently, but then in its adversative role. But much more important than its function as a force hostile to the environment, is its role as a productivity-enhancing and resource-sparing factor of production. The history of economic progress is closely connected with the advancement of technology as a complementary factor of production. As a substitutional factor it is particularly associated with increasing relative scarcity and cost of labour in the developed countries. Usually the two attributes are being manifested contemporaneously; with complementarity the dominant one in communities where limited natural resources constitute the constraint to economic growth. The technological "entity" being made up of hardware, software, human skills and organisational knowledge (creative capability), we have embodied and disembodied technology. It is the former that we are, in the main, concerned with in this Chapter, the two main branches of which are industrial and bio-technology, the former embodied in capital equipment and intermediate inputs, and the latter in intermediate inputs.

Given the demographic characteristics of a community confronted by a limited amount of natural resources, and having in mind that the object of economic activity is purportedly to maximise economic welfare by way of an optimum combination of factors of production, the discussion is bound to revolve around the question of the appropriateness of the technology and capital in use, or to be used, whether as complements or as substitutes.

8.2 AGRICULTURAL TECHNOLOGY

8.2.1 Its economic function

In a study of the grain outputs in 46 countries around the world (Hyami & Ruttan, 1971, p 7) it was found that the role of technology (T) tended to depend upon the relative scarcity of labour and land. Where (a) land was relatively plentiful and the rural population small and shrinking, agricultural output per male worker was maximised (e.g. New Zealand, Australia, United States, Canada); and (b) where the rural populations were large and growing, and the arable land area *per capita* small, the output per hectare was promoted (e.g. Taiwan, Japan,

Mauritius, Suriname, Ceylon) by means of technology. A (c) third category of countries was encountered (LDCs) where neither of the two output ratios reflected a distinct influence of technology.

This appropriateness is measured by the degree to which it is adapted to the economic/ demographic environment in which it operates. To generate the optimal economic outcome it should be concordant with the conditions of demand and supply, among which the two population-related determinants feature prominently, namely, (i) the size of the labour force and its skill composition, particularly in relation to the availability and cost of capital, and (ii) the effective size of the market, that is, population numbers times per capita income. Obviously, when the size of the market is not defined by the purchasing power of the local population but by international demand, the second of the two determinants will be reduced in importance, but no necessarily rendered out of contention, if and when the domestic market serves as a foundation in the exploration of foreign markets (which latter aspect is dealt with in Chapter 14). Since, in respect of both the above determinants the South African population has, in broad terms, a First and a Third World, or developed and developing, component, appropriateness does not signal a one-dimensional magnitude, particularly when the distribution of land resources is allowed for as a third determinant.

Assuming commercial - as opposed to subsistence - farming, supported by the necessary disembodied technology, (b) and (c) category countries can attain a high degree of efficiency in their production of food, by embodied technology in the form of intermediate inputs which are the products of biotechnology research. They allow labour to reach high levels of productivity without necessarily requiring the aid of costly capital equipment which involves long term financing. Inasmuch as they have been generated through research and development (R&D) not paid for by the users, and had become part of public domain, they are also comparatively inexpensive, and the cost involved can be defrayed out of the proceeds of current production. There is a danger that this advantage might be threatened if industrialised countries and multinational corporations were to succeed in acquiring patent controls (copyright) over their biotechnology products, which will accord them monopoly power and which is likely to be reflected in the prices for the innovations and discoveries in question. Indian farmers are said to have been demonstrating vigorously against such patenting (Bryant, 1994, p 38).

In addition to the inputs of biotechnological nature there is yet a role for industrial technology

embodied in both intermediate inputs and capital equipment, amidst plentiful labour supplies. These latter can become inadequate during seasonal peaks of intense agricultural activity. Labour demand peaks during land preparation and sowing and planting in dry climates, and during harvesting in more humid climates to prevent damage to crops caused by humidity. Where multiple cropping in rapid succession is practised, a great deal of activity has to be crammed within short periods of time: a first crop harvested and transported to the market, the soil prepared for the next crop after which the new planting season is to be completed. In these circumstances recourse is to be had to mechanical technology appropriate to the needs and financial capacity of the small farmer, i.e. to satisfy the efficiency-maximising conditions of production factor application. In this regard the movement of intermediate technology supporters, founded by the author of *Small is Beautiful,* the late E.F. Schumacher (1994), presented "one hundred innovations for development", appropriate to the economic circumstances of developing communities. These include such equipment as treadle pumps (foot operated), miniaturised hand tractors and planters.

In South Africa, with a super-abundance of unemployed lesser-skilled labour, there are two agricultures: the subsistence type - where economic welfare might conceivably be enhanced by equalising the marginal disutility of effort and the marginal utility of income - involving few attempts at maximising the marginal product of any factor of production; and the commercial sector where units are, as a rule, large and increasing in size, and labour is being substituted by the most advanced technology. From a total of 120 000 at the beginning of the 1950s the number of farms fell to fewer than 60 000 in the middle nineties, raising the average size by just on 100 per cent (CSS, 1990; SSA, 1999).Where possible, and encouraged by the desire to realise the economies scale and by taxation policy, the planting and harvesting processes have been mechanised. In maize farming the use of combines reduced the labour requirements during harvesting and threshing by some 70 per cent, while the latest weeding techniques lowered the seasonal labour force requirements by 60 per cent (Wilson, 1984, p 80). In the case of permanent workers the degree of substitution was a good deal lower, but still substantial, involving approximately 230 000 during 1970-1995. The process is bound to be continued and intensified by the new labour legislation which allows for legal strikes in agriculture at the height of the season, making it potentially possible for trade union action to deprive a farmer of his year's income in a labour-preponderant production process.

8.2.2 Achievements and effects of biotechnology

What can be called the classical or first generation biotechnology research, which was

responsible for the Green Revolution, was based on the writings of Darwin and the Mendelian laws of inheritance. The cornerstones of the experimentation in plant breeding were, according to the Nobel Prize winning agricultural scientist, N.E. Borlaug (1983, pp 61/62) "the conscious introduction of genetic diversity into populations by intercrossing or mating selected germ plasm with outstanding characters that complement one another and the selection of superior plants with genes for desired traits until higher levels of improved adaptation (reproductive fitness), genetic uniformity, and agronomic stability are reached". Selecting the superior parent types, possessing the desired characteristics, in repeated hybridisation programmes, high yielding varieties of plants and seeds, which can withstand the rigours of different climatic environments and disease, have been produced. And so were born the short stalk hybrid maize, the dwarf wheat and the miracle rice which are the staple ingredients of the world population's diet, and which ushered in the Green Revolution. In the USA the yield per hectare of maize increased from 1,80 tons in 1938/40 to 6,32 tons in 1978/80 and of wheat from 0,96 to 2,22 tons, that is, by a factor 3,5 and 2,3 respectively (Borlaug, p 65). Between 1950 and 1984 the world's grain output increased 2,6 fold or almost 3 per cent per annum, which signified an increase in *per capita* production. During 1984-91, however, production seems to have reached a plateau despite a lavish application of fertiliser (Myers in UN 1994, p 56, Brown, *et al.*, 1992, p 25). The latter has been experiencing diminishing returns. From 22,19 tons in 1950 the amount used per ton of grain produced rose to 80,19 in 1991 - raising the marginal rate of application per ton from 60 kilo during 1950-60 to 219 during 1985-1991 - while the energy consumed increased from 0,44 barrels of oil equivalent to 1,14 tons in 1985 (Brown, *et al.*, p 41). Which means that as long as population is growing, mankind, in his search for new technological frontiers has to run fast to remain in the same place, and faster to remain slightly ahead, having to contend also with the productivity-reducing environmental depletion following in the wake of the new technologies. Accordingly, the battle is continuing to improve upon improvements, developing new fast-growing varieties increasingly resistant to drought, inhospitable soils, pests, etc., and engendering higher yields, which, in addition, have to compensate for the conversion of grain into meat arising from higher living standards.

To derive the maximum, or some, benefit from the Green Revolution certain conditions have to be satisfied, assuming that more than just a modicum of farming expertise exists. A very generous application of fertiliser is required, as has already been demonstrated above. For the fertiliser to be effective a good deal of water, at the right time and in the right amount, is required which, if the precipitation is not regular and adequate, as in South Africa, irrigation

has to provide. Agriculture in South Africa is already the largest single user of water, and the extensibility of irrigation is very limited. Since weeds and pests are likely to thrive as well as beneficial plant life, herbicides, insecticides and fungicides have to be resorted to. To save 16 billion dollars' worth of food and fibre crops, which would otherwise be destroyed, US farmers are spending 4,1 billion dollars on pesticides each year. In South-East Asia, where early maturing rice can be cultivated on a continuous basis on irrigated land, ten to 20 applications per annum became common, while cabbage plants have to be sprayed every two to four days (World Resources, 1987, p 46). When the animal life hostile to humankind develops resistance to the chemicals involved, new types of pesticides have to be generated, when intensified applications cease to have the desired effect. World Resources 1994-95 (pp 111-113) reported that more than 500 crop-destroying insects and mites were becoming resistant to pesticides, and their control became more costly because of the need for pesticides to be species-specific to prevent damage to the eco-system. And apparently the croploss due to pest damage during the past fifty years has not measurably diminished.

The implementation of the above procedures requires a concomitant financial capacity, and this subsistence and other small farmers do not have. Communities needing the benefits of the Green Revolution most cannot afford to realise them, particularly since the high-tech inputs will have to be imported for which the necessary foreign exchange is lacking. Of the developing countries, Kenya, Mexico and India have been held up as examples of success stories. However, because of rapid population growth, rising nutritional levels, as well as the environmental degradation consequential upon the practising of the principles of the Green Revolution, the benefits of the latter have been overtaken by events. The covert costs of the Green Revolution include the waterlogging and salination of the soil, the nitrification of neighbouring waters, the spreading of water borne diseases and the poisoning of animals and humans. Of Mexico it has been said that one-tenth of irrigated land has become severely salinised while one-fifth was in need of rehabilitation (People and the Planet, 1994, p.14), and the country has become a net importer of food since 1986. India's Green Revolution has been "going brown round the edges" with a quarter of its irrigated land "in danger of being rendered unusable by waterlogging alkalinity and increasing salinity, caused by inadequate drainage of irrigation water" (The Population Crisis Committee, 1987, p 3). The high-yielding plant and seed varieties do not produce expected results when inputs of fertiliser and water are not properly controlled.

The new generation biotechnology followed in the footsteps of the molecular biologists who

discovered how to cut and splice DNA, which is the foundation of genetic engineering. Expectations have been raised of a second Green Revolution spawning ultra-high yield varieties of humankind's staple crops. A major advance has been the creation of transgenic plants, i.e. into which foreign genes have been transferred, to offer protection against pests, diseases as well as specific pesticides. For example, to facilitate weeding by means of herbicides without damaging the non-target species, herbicide-resistance has been cloned into commercial tobacco cultivars by the CSIR (1992, p 29), and into strawberry plants by the Stellenbosch Institute for Fruit Technology (Metelerkamp, 1995, p 10). US scientists have genetically engineered a tomato cultivar to endow it with a long shelf life. The Stellenbosch Institute has been the first in Africa to isolate a gene and clone it into a plant to render it immune to viruses.

Genetic manipulation also promises to generate new breeds of animals which have already been improved in quality by the classical inbreeding process. Resulting from more than five generations of selective breeding, the Mexican mini-cow was generated - starting from an Indo-Brazilian zebra - which produced one-half to two-thirds of the milk volumes of her progenitor while consuming only one-tenth of the latter's required grassland (World Development Forum, 1987, p 1). The new technology has genetically manipulated bacteria to act as a creator of a chemical which boosts milk production. A frozen embryo has been implanted into the water buffalo - the beast of burden, and the producer of milk and meat of Asia - to create a new breed of buffalo that would produce more food for their owners while consuming less, attain maturity at a younger age and calve more frequently (World Development Forum, 1990, p 1).

At the same time attention is devoted to "natural technology" which refers to the harnessing of nature without genetic intervention, to attain ecologically and humankind-friendly results. Research into the properties of plants has uncovered halophytes which grow well in saline water and soils, can contribute to soil reclamation and combat desertification (World Development Forum, Sept 1990, p 3); the neem tree that can be used against such pests as locusts and mites and bears seeds which can be crushed for making fertiliser; and hundreds of other plants that require little moisture, bind the soil, fix nitrogen in the soil, and act as natural insecticides (World Development Forum, 1987, July 15, September 30). The benefits of agroforestry are publicised. Attention is drawn to the use of compost, which is organic waste converted by heterotrophic bacteria into stabilised organic material, which is not a fertiliser but contains trace elements such as zinc and magnesium and has the advantages of releasing

nutrients to the soil more gradually than inorganic fertiliser; and a French company uses earthworms to produce a high quality organic soil conditioner out of domestic refuse. Indigenous predators are being used against common orchard pests, permitting the use of milder chemical pesticides, and reducing the required number of applications (Du Plessis, 1994, p 12). And food supplies are being supplemented by means of mariculture in the production of oysters, lobster, salmon, trout and other fish, thus reducing the demands made upon the wild stock.

8.3 INDUSTRIAL TECHNOLOGY

By now it is clear that environmental issues have become a market force so that the optimal use of technology entails the satisfaction of two main conditions: (i) it has to be compatible with the endowment of the other factors of production, and labour in particular - although allowance could conceivably be made for a trade-off in its favour (for its productivity-enhancing benefits) *vis-à-vis* employment in individual cases - assuming, of course, that the combination of factors is not interfered with by inappropriate pricing, that is, which does not reflect relative scarcities or abundance; (ii) it should support sustainable economic growth by avoiding, as far as possible, the depletion and degradation of natural resources. It is, however, scarcely conceivable that individual researchers with the inquisitive instinct, and desiring to probe the unknown, will be confined by such prescriptions.

Starting with the Industrial Revolution, mechanical technology has reached a most advanced stage at the end of the twentieth century in the micro-electronic revolution based on the silicon chip on which millions of characters or artificial memories can be stored, and which is incorporated in electronic equipment such as computers, word processors, communication systems and robots (automated machinery). It is information- and knowledge-increasing and labour-saving technology, which is, or can be, used to raise productivity. And it is foreseen that nanotechnology – in 1998 still in its infancy – in which atoms are manipulated directly, will provide a basis for a new industry of molecular manufacturing (IFR, 1998, pp 4-14). It would appear that the gap between the levels of technological sophistication and the requirements of the less knowledgeable, financially weak, small-scale industrialist in the labour abundant economies catering for a limited domestic market, is forever widening. Even in the highly developed countries, where labour is the relatively scarce factor, it is feared that the latest developments have a more than average adverse effect on employment. The optimistic argument is that the fears already expressed two centuries ago, in the form of the

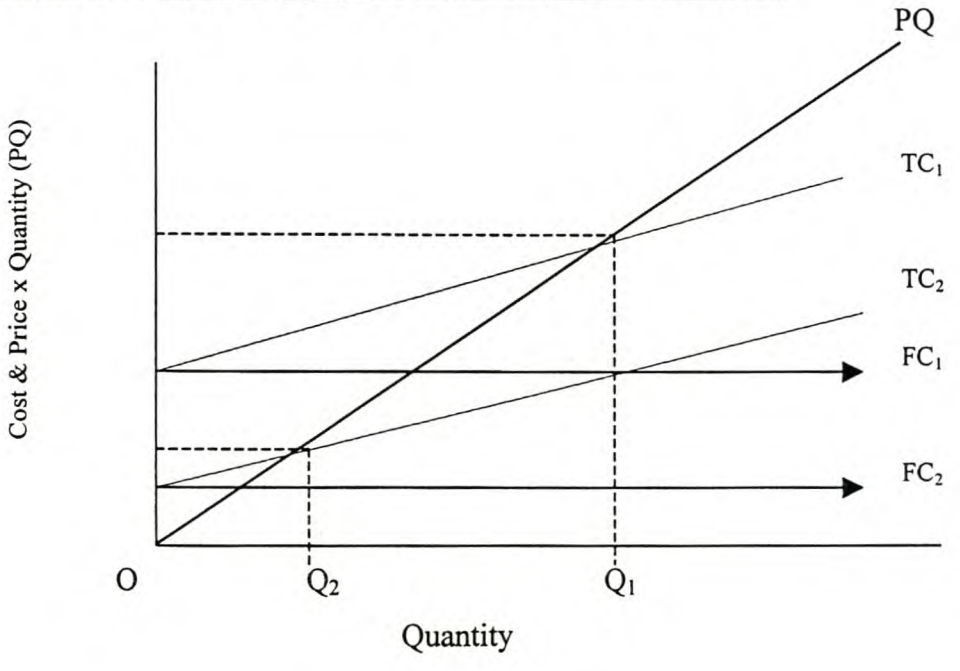
destruction of textile mills in Britain, have not been realised in the long run: technology has, for the most part, rather been a living standard-raising force. That it turned out to be thus is a function of the fact that while it has been incorporated in labour-saving devices, it has also been a demand-expanding factor. By raising productivity it reduces the production cost of the products affected which, with reasonable price elasticity, leads to increasing sales. The portion of the higher incomes, ensuing from the higher productivity, spent on goods other than the technologically favoured, induces increased supplies to satisfy the greater demand, thus generating additional job opportunities. When the technological change is revolutionary the adjustment may take a longer time, or be inadequate to absorb the displaced labour. The problem is that the latter may not have the required skills or talents.

While compensation for the loss of income by means of a redistribution of income, through the national budget, does not necessarily compensate all individuals for the loss of jobs which have a moral content for the incumbents, it is a situation which can at least be economically accommodated by the developed, affluent societies. This does not hold for the LDCs where appropriateness has, therefore, a much greater significance than in the MDCs, since inappropriate technology may conduce to an outcome worse than unemployment-creation namely impoverishment. As the modern technologies are being developed in the MDCs they are suitable to the economic circumstances prevailing there. The LDCs tend to adopt them without regard to their own factor endowment, which is an outcome, more often than not, of advice tendered by consultants from the MDCs, or when foreign aid is tied to the supply of equipment manufactured by the donors' enterprises. Or the allure of the sophisticated equipment may be so powerful that it is employed regardless of the returns that can be expected. It has been alleged that during the 1980s South African businesses had large amounts of information churned out by their computers which were not used to raise efficiency (Ryan, 1994, p 11).

Assuming production for the domestic market only - though export-led economic development is an option as has been observed in developing South East Asian countries - technology in LDCs is required to be compatible with large quantities of available lesser skilled labour, arising from rapidly growing populations. The use of equipment which requires imported labour for its maintenance and repair, consumes scarce foreign exchange, apart from diminishing job opportunities for local labour. Included in the generic "labour" is the entrepreneur who, in Africa, is likely to be a peasant lacking the disembodied technology except for some procedures in the management of his land inherited from ancestors, or a small

trader. His financial resources, like his scale of operations, are minimal. The customary high level technology available from the developed world is too far beyond his ken and capacities to serve as an aid to the breeding-ground of the "infant entrepreneur". It is embodied in capital-intensive manufacturing procedures requiring a great deal of energy, highly skilled maintenance workers, large markets, a capital-intensive infrastructure and supporting industries. And since it has, concomitantly, an urban bias the labour force needs to migrate to towns and cities to make a living. The natural resource endowment of a country constitutes another criterion: using technology to produce synthetic fabrics in countries which produce cotton at low cost would be contra-indicated. Manufacturing shoes made of plastic in a capital intensive process in a developing country which produces large amounts of skins and hides which are being converted into shoes in labour-intensive enterprises (as occurred in a Latin-American country), is economically insensible. The introduction of the latest technology to produce food in competition with traditional foodstuffs can have an adverse effect on the poor by providing nutritionally inferior products at higher prices, but enjoying profitable markets because of superficial appearance and the ability of the financially strong companies to lure the consumers by means of advertising. The size of the local market for non-staple products, as limited by rapid population growth, imposes a constraint. This is illustrated in Figure 8.1 where FC_1 and TC_1 represent the fixed and total costs respectively - the difference reflecting the variable costs - entailed in a sophisticated large scale production technique, and FC_2 and TC_2 the comparable costs in an adapted version suitable to a smaller market. The break-even point at a given price in the latter case requires a much smaller volume of demand, Q_2, compared to Q_1.

Figure 8.1: LEVEL OF TECHNOLOGY AND MARKET SIZE



Gillis, *et al.*, (1992, p 565), in a juxtaposition of three technology levels, low, intermediate and high in (i) a rich and (ii) a poor country, quantifies the costs of capital and labour in textile weaving to demonstrate superiority - in terms of costs - of the highest level of technology in (i) and of the intermediate level in the poor country. If, for the latter, a one-third lower wage than in the first round exercise, is assumed, the lowest level of technology would be the cost-effective one.

If the international, and not the domestic, market is the target in a quest for export-led economic development, entailing a first concern need for producing at internationally competitive prices, the latest high level technology acquires priority status, the other factors of production having to meet the demands of the technology. With their well-educated and skilled labour force the East Asian tigers could satisfy this condition for some three decades to attain remarkably high rates of growth until the economic setback in 1997. This growth generated the job opportunities for the increase in the labour force (The Economist, 1998, p 18; IFR, 1998).

How does South Africa feature in the above *mise-en-scene*? As emerged from the discussion in Chapter 6 the mixture that the South African economy is, encompasses rather more than just a gradation of enterprises on the size and scale spectrum. There is the reasonably developed formal sector - which can be conveniently characterised as Euro-oriented - into which only a portion of the population emerging from Third World conditions – Afro-centric or Afro-oriented is a convenient appellation - have been drawn. This leaves around one-half of the latter population operating within the confines of an under- or undeveloped sector. Their technological needs, from the entrepreneurial point of view, contrasts with those of the sophisticated sector in the same way as the needs of the LDCs contrast with those of the MDCs. Until the mid 1980s, before it became a technology transfer organisation, the major official research body in this regard, the CSIR, tended to have the character of "an institution with questionable relevance to the developmental needs of the country" (Ryan, 1994, p 13). While it had been responding positively to the individual requests for scaling down the capacity and costs of equipment embodying the most advanced technology, it used to cater mostly for the hi-tech requirements of a developed economy. (While he was a member of one of their committees during the 1960s, this author's attempts at persuading the institution to enter purposefully the field of intermediate technology, did not meet with success). Its changed character is, perhaps, exemplified by the development of a dehuller, intended for

small entrepreneurs who process sunflower oil and, to this end, need to remove the hulls from the sunflower seeds (Hall, 1995, p 1).

However, in light of the nature of its economy and of its endowment of natural resources, appropriate technology in South Africa, from the national perspective, does not have an exclusive character. The choice of technology has to fit a diversity of circumstances ranging from those of the underdeveloped subsistence sector to those of, say, one of the most advanced banking systems in the world. The exploitation of some of the country's natural resources impels the application of the most sophisticated technology which, suitably, can in some cases be combined with relatively large numbers of lesser skilled workers. The mining of coal, gold ore and other minerals and metals, the conversion of coal into electricity, of bauxite into aluminium, etc. necessitate the use of high cost high technology. And since their markets are mainly overseas, the size of the local market, as a function of its population and income *per capita*, is not a consideration. The ability of these industries to produce at costs lower than the international prices is at issue. And as net foreign exchange earners they do not constitute a drain on scarce foreign exchange reserves, and provide the necessary wherewithal for net foreign exchange consumers. They are a source of savings for investment and creators of some job opportunities, even though at a very high fixed cost per employee. In respect of direct employment there is in South Africa an apparent conflict of interests emanating from the abundant coal deposits, on the one hand, and the abundant supplies of lesser skilled labour, on the other. The conversion of the former into petrochemical products – to economise on foreign exchange required for oil imports – demands the highest levels of technology embodied in large amounts of sophisticated capital equipment per worker, leading to minimal employment of labour.

The contrasting examples of the US and Japan may have a lesson for South Africa. The former, devoting two-thirds of its research funds on product development, allocates 88 per cent to hi-tech, 8 per cent to intermediate-tech and 4 per cent to low-tech. In Japan, spending two-thirds on process development, the appropriations are 21 per cent, 12 per cent and 67 per cent respectively (Ryan, 1994, p 12).

8.4 ENVIRONMENTAL TECHNOLOGY

Arising from the concerns about the consumption of natural resources, particularly as manifested in environmental degradation, which issue has been kept in the forefront by Greenpeace activists, Green (political) parties, Earthlife Africa, newspaper campaigns and

international conferences, a new growth industry based on environmental technology has sprung up. There are two branches to this industry: (i) Managing the results of humankind's onslaught on natural resources; and (ii) Attacking the problem at its origin by changing the technology responsible for the undesirable conditions. With regard to the former, governments have been provoked into passing legislation requiring businesses to disclose the amount of dangerous waste released by them, and the ensuing adverse publicity acted as control-by-embarrassment incentive to avoid the undesired practices. In the US the investigations for the purpose of disclosure alone cost 346 million dollars a year (Regan, 1993, p 27). International agreements as contained, for example, in the Basel Convention, make it increasingly difficult for the developed countries to export their toxic waste to LDCs, of which it has been said that they were still "under-polluted", and whose poverty conduces to acquiescence because of the recompense involved. South Africa has more than 35 Acts of parliament and provincial ordinances (IFR, 1991, p 6-153) and a Council for the Environment encouraging the examination, by enterprises, of their manufacturing processes in the interest of conservation.

Governments have also targeted individual sources of pollution, of which the internal combustion engine is the obvious one in towns and cities. Stringent emissions standards for motor vehicle manufacturers in the US could add 500 to 1 200 dollars to the price of a car (Harrington and Walls, 1994, pp 2-6), and the installed control systems break down as they grow older. The unleaded petrol introduced in South Africa to eliminate the environmentally harmful lead emissions, was estimated to entail a cost to motorists of many billions of Rand (Wang, 1993, p 4; de Lange 1995, p 12). There seems to be consensus that the benefit to the environment would be minimal but that this new technology - which reduces the octane content of petrol - is to be introduced to retain competitiveness for South African manufactures in international markets. The platinum-based catalyst in car exhaust pipes, prescribed by some countries, reduces the carbon monoxide emissions, but it does this by converting it into carbondioxide which, as we have seen, is a greenhouse gas and a polluter. As a major platinum producer in the world, South Africa derives some benefit from this control measure.

South African businesses are being persuaded or exhorted to reduce or eliminate the pollution they are responsible for, and in a case like toxic or dangerous wastes there is no room for compromise. Before they can start a new venture in an ecologically sensitive area (The Kruger National Park, St. Lucia, Saldanha) they have to proffer evidence that they will not

cause harm, or more than a minimum of damage, to the environment. While cost-benefit analyses are supposed to provide answers, there is a problem when the preservation of pristine, unspoilt nature becomes an absolute value and does not permit of a trade-off, in which case the community may have to sacrifice economic growth for aesthetic gratification.

Proponents of the extension of electricity to everybody in South Africa as a means of reducing air pollution in cities and towns tend to forget that the use of this source of energy requires expenditure on appropriate equipment, and that using it in winter for heating purposes in the townships would be more expensive than coal burning (which provides energy for both cooking and heating). At the same time the substitution of electricity for coal means that the coal-burning, and thus the pollution, is shifted from the townships to the Eastern Transvaal Highveld, where there are, of course, fewer people living in the immediate vicinity of Eskom's 8 coalfired power stations. When Eskom contemplates the cost of controlling the particulates emitted, management concludes that the amount at stake would be more beneficially spent on the electrification of Black towns. What with annual emissions in excess of 125 million tons of carbon dioxide, carbon monoxide, hydrocarbons, nitrous oxides and sulphur dioxide, the cost of cleaning up operations will run into billions of Rand. The order of magnitude is suggested by the capital outlay of more than R500 million, and running costs of R100 million per annum, involved in desulphurising one 3 600 MW power station. More than half a billion Rand has already been spent to control atmospheric pollution (Huntley, *et al.*, 1989, pp 63-67). Iscor, another source of pollution, had spent R65 million by 1992 to clean up its furnaces and underground water chambers (Ryan, 1994, p 2). The mining industry, too, has to spend large amounts each year on cleaning up operations.

With its extensive coastline South Africa cannot prevent oil spills caused by passing foreign ships. So the CSIR's section on Earth, Marine and Atmospheric Science and Technology has developed a predictive model which enables the authorities to plan ahead and reduce the impact of oil spills on the coastline (Knoetze, 1994, p 2).

The re-use of materials has a significant contribution to make to the management of the environment. While reducing the pollution by household and industrial wastes, recycling has the beneficial attribute of saving materials, using less energy in reproduction or processing, and providing income opportunities, particularly in poor, labour-abundant communities, to hundreds of participants in the collection of what otherwise would be wastes. The outstanding example in South Africa is the recycling of waste paper which forms 34 per cent of municipal

wastes on which Cape Town, Johannesburg and Durban have to spend in excess of R200 million annually to collect and dispose of in landfills (Viljoen, 1995, p 5). Two companies which have launched a War-on-Waste campaign, have established some 100 sites in Black townships which contribute to the recycling of 607 000 tons of the 1 800 000 tons of paper and cardboard consumed annually in South Africa, in mills which use 0,46 kilo of chlorine per ton produced compared to 4,9 kilograms in mills using virgin fibre, and require 25 per cent to 60 per cent less energy in production (Mestel, 1994, p 10). The campaign could save the country more than R20 million in foreign exchange spent on waste newspaper imported from the US (Anon, 1994, p 30).

Three-quarters of a motor vehicle, consisting for the most part of steel, are recyclable. And steel produced from steel scrap uses 60 per cent less energy than that manufactured from iron ore. Recycled aluminium needs only 4 per cent of the energy required for the conversion of bauxite, and is more labour-intensive than smelting. An aluminium can plant established near Johannesburg has managed to retrieve 20 per cent of the 400 million cans produced by it for recycling. Iscor is recycling a similar number and in addition 840 million cans made of steel, representing 37 per cent of annual production (Iscor, 1998). A considerable portion of glass is being recycled. A useful function has also been discovered for old car tyres: rubber shavings are mixed with asphalt in road building, and old tyres are deposited in erosion dongas to allow the latter to become silted up.

To attack the problem of environmental degradation at the origin will require technologies that will radically reduce the consumption of raw materials. A German researcher has argued that a 50 per cent reduction in materials consumption world-wide was required to create a sustainable materials economy (Young, 1995, p 77). To this end the material- and energy-efficiency of production has to be raised. It has the appearance of a very formidable task. Atomic power plants have been constructed to economise on coal and oil, but their image has been tarnished by accidents, particularly that in Chernobyl, which has been destructive of the environment. An area of more than 3,5 million hectares beyond the 30 kilometre zone of the Chernobyl plant has been contaminated with the discharged radio-nuclides, compelling the removal of people from 200 settlements and exposing millions to doses of radiation, and severely damaging the region's harvests of fruits, berries, mushrooms and hay (Rybakovsky in UN, 1994, p 187).

Seeking less dangerous sources of energy which are also more appropriate to the needs of the

poorer communities, thoughts have turned to the harnessing of the sun as a renewable source, through the use of photo-voltaic panels that convert sunlight directly into electricity, solar cookers and steam energy. This technology has made considerable headway in a number of African countries (Bryant, 1994, pp 42/3). It is claimed that for every 24 million people who install solar cookers 3,2 million tons of firewood is saved and 6,7 million fewer tons of carbon dioxide are emitted (Populi, 1994, pp 12-14). Again, to economise on energy used in sophisticated equipment, recourse is had to "pinch analysis" which ensures that heat which is available, after it has performed its task in one part of a process, is captured, to be applied to a next phase in the process which can be operated at lower temperatures (The Economist, 1994, pp 20-26). Buildings can be rendered more energy-efficient by using appropriate insulating and other relevant materials.

In the field of transportation intermediate technology has been embodied in an "Africar" which has a chassis made of impregnated plywood, and can be profitably produced at volumes as low as 5 000 units a year (World Development Forum, 1989, p 1). Cars using electricity as motive power are being experimented with.

To replace the CFC refrigerant gases, responsible for damaging the ozone layer, the hydrochloro-fluoracarbon (HCFC) variant was developed, followed by Greenpeace's resurrection of an older hydrocarbon refrigeration technology. The latter is reported to be inexpensive and environment-friendly, and the products have been successfully marketed (Gilman, 1994, pp 10-13).

While the new growth industry entails costs to the users, it has, apart from its environmental benevolence, some positive economic benefits as well. It is reported to be a R600 billion-a-year business which, accordingly, offers profitable opportunities to private enterprise (Briscoe, 1993, p 9). While most of this amount should, in national accounts, probably be entered as a contra-item to the cost of degradation of the environment, it has the beneficent side-effect of providing investment opportunities to activate the savings which, in the high income economies, may become an *embarrass-de-richesse*. and in the process creates additional employment opportunities. It acts as a countervailing force to the living standards-detracting potential of the measures to combat pollution and waste, and can compensate to an extent for the economic impetus not provided any more by vibrant population growth in the developed countries.

8.5 IN SUMMARY

The function of technological progress is to push outward the frontiers of the productive capacity of any one or more of the other factors of production. Its optimum application depends upon the nature of the supplier of the latter and the markets for the output promoted by it. When required to act in purely complementary fashion, particularly when the production involved is not circumscribed by the size of a domestic market, its optimal application depends on its availability, regardless of the supplies of the other factors of production of which it will be required that they conform to the demands of the technology used. (A relevant example would be the exploitation of a mineral resource, enjoying a world wide demand, by an LDC with a rapidly growing population in need of maximum employment opportunities, the direct creation of which is likely to be impeded by the technology).

However, technology also operates in substitutional manner, in which case the relative scarcity, alternatively abundance, of labour, capital and natural resources – entrepreneurship considered non-substitutable – whose use is to be optimised, is the prime consideration. In a MDC with little or no growth in population or labour force, high level technology will be substituted for scarce labour. In LDCs labour (quantity) is the abundant factor whose employment has to be promoted, in which case the (small-is-beautiful) low-level industrial technology is to be opted for. But in these same countries the rapid population growth exerts pressure on fixed quantities of natural resources, such as land and water, which renders them the scarce production factor whose productivity per unit has to be maximised by the application of high level bio-technology.

Finally, it turns out that once technology has been put in motion it has, metaphorically speaking, to run fast to keep ahead of growing population numbers and their appetites – to which the life-saving effects of industrial and bio-technology, in conjunction with technological progress in medical technology, have contributed – since it is also required to compensate for the detrimental side-effects of its success (environmental degradation, that is).

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CHAPTER 9

CAPITAL

9.1 THE NATURE OF CAPITAL WITH RESPECT TO POPULATION

At the lowest level of economic development, as experienced by a community dependent upon peasant agriculture, capital assumes the form of breeding stocks of animals. Though amenable to improvement in quality through bio-technology, the herds – due to limits imposed by nature – cannot be accumulated indefinitely to serve as basis for maintaining or raising the levels of living of growing populations. For the latter to be achieved an accumulation is required of fixed long-term capital, such as occurs as a community progresses from peasant agriculture to commercial agriculture, to the industrial (secondary), the tertiary and higher stages of economic development. Fixed capital, in the system of national accounts is made up of residential, commercial and industrial buildings, construction works, machinery, transport and other equipment, data on which are furnished by the SA Reserve Bank (1994 Supplement; 1998 and previous issues).

As in the case of technology, capital can serve as both complement to, and substitute for, labour and natural resources. In economically successful, but natural resource-poor, countries (e.g. Japan) the dearth has to be compensated for by large-scale capital formation operating in combination with efficient labour. In South Africa the beneficiation of mineral resources, with which it is relatively well endowed, requires capital intensive methods of production, which enhances the GDP, but raises the country's incremental capital-output ratio (ICOR, and thus also the COR), and the capital-labour ratio. Which means that both the complementary and the substitutional roles are in action. When new projects of this type are undertaken industry mix-induced capital deepening occurs.

The relationship between capital and population growth is self-evident. Given the level of technology, a fixed supply of natural resources and a constant COR, the amount of capital has to increase *pari passu* with population growth to maintain the per capita supply and, *ceteris paribus*, the output per capita. The volume has to expand faster if employment levels are to be maintained while – as in South Africa – the labour force growth exceeds that of the population at large.

In theory, the capital at issue can be split into two components: A. that which is directly demographically induced – "demographic" capital for short and ease of reference – a function, that is, of population size, growth, family formation, spatial distribution, etc., to provide (i) shelter – houses and facilities associated with it such as water supplies, sanitation, light and heat; (ii) means of communication such as streets, roads, bridges, railways, telephone links;

(iii) government services requiring buildings, transport and other equipment and the infrastructure mentioned in (ii); B. the remaining portions, which can be labelled as "production" capital providing the elements of living standards not mentioned in A. In practice, a quantified separation of the two components is not possible since, housing apart, the infrastructure and equipment in question – in consequence of composite demand – serve the ends involved in both A and B concurrently.

Arithmetically and functionally the two components are interdependent. While the amount of B available can be said to determine, in the last resort, at what level the needs involved in the A ("demographic" capital) component can be satisfied, the amount, viewed as a residual, is at the same time circumscribed by population tendencies. The faster the population grows and the more widely it is scattered, the greater will be the need for "demographic" capital. The South African population is, in part, concentrated in four major industrial areas situated far apart and, for the rest, widely scattered in rural areas and small towns. Linking the communities by means of the usual communication mechanisms is a capital-exacting process. These circumstances conduce to a relatively high COR but will, of course, not raise the national average unless the shape of "demographic" capital in the national aggregate is raised by way of either increased attention to the satisfaction of the needs in question, or the waning of the B-type of capital formation.

Table 9.1 provides some relevant statistical information.

TABLE 9.1
COR AND CAPITAL STOCK GROWTH RATE P.A. (ΔK)
BY ECONOMIC SECTOR

Sector	1960-1969		1970-1979		1980-1989		1990-1995	
	COR	ΔK %	COR	ΔK %	COR	ΔK %	COR	ΔK %
1 Agric., forestry & fishing	4,02	2,2	4,14	2,6	3,85	-0,9	2,86	-1,7
2 Mining & Quarrying	0,82	1,9	1,05	5,7	2,12	6,3	2,93	0,3
3 Manufacturing	0,94	7,7	1,06	7,7	1,47	3,0	1,70	3,4
4 Electricity, gas & water	6,99	5,5	6,68	7,8	7,76	4,7	6,28	-2,6
5 Construction	0,24	11,2	0,38	10,8	0,59	-0,4	0,58	-1,5
6 Trade, catering & accom.	0,97	5,0	0,96	5,6	0,99	2,0	1,02	1,2
7 Transport & Communic.	6,85	4,8	6,59	6,2	6,85	1,5	6,29	-0,2
8 Finance, Ins.& Bus.Serv.	3,98	4,7	4,28	5,1	4,40	3,3	4,53	1,1
9 General Government	3,72	7,2	4,99	6,7	5,33	3,0	5,97	2,0
Aggregate	2,30	5,2	2,62	6,1	3,17	2,9	3,37	0,9

Source: Prinsloo & Smith, 1996, pp 35, 41. Their Sector No 9 (Community, Social, Personal Services) has been replaced with General Government as derived from SARB, 1994, 1998.

The data in Table 9.1 record an increasing capital intensity of the South African production process. From a low of 2,13 in 1964 the COR rose to a peak of 3,47 in 1992. The decline thereafter to 3,25 in 1997 (SARB, 1998, S-145) coincided with increased use of productive

capacity as the GDP growth rate changed from a negative –1,18 per cent per annum during 1989-92 to a positive 2,46 per cent per annum during 1992-97 (SARB, 1998, S-109). The long term capital deepening arose from both across-the-board intra-sectoral capital intensification and changes in the sectoral composition of the economy.

Of the 9 sectors in Table 9.1 the fluctuating COR of only number 1 – Agriculture, Forestry, Fishing – can be said to manifest a long term declining trend, some outlier values in 1983 and 1984 notwithstanding. The COR of sector no 6 – Wholesale and Retail trade, Catering and Accommodation, with an outlier value of 1,12 in 1979, remained on a reasonable even keel of close to 1. The COR series of no 4 – Electricity, Gas, Water – describes a long cycle over the period 1960-1986, with the nadir at 1975, and a monotonic decline after 1986. No 7 – Transport, Storage, Communication – experienced a similar cycle, but its second peak precedes that of no 4 by three years, followed by a downward movement. Deeming manufacturing as the norm, no 2 – Mining and Quarrying – used to be a labour-intensive industry or, perhaps more correctly, non-capital-intensive, since a production process could yet be technology- and natural resource-intensive. But its COR has risen faster than that of any of the other sectors to culminate in 3 at the end of the 1990's, after having been 0,74 in 1970. While Manufacturing's (no 3) COR has doubled between 1964 and 1993, it is (at 1,79 in 1993) still to be considered labour intensive, compared to the national aggregate of 3,37 for 1990-95. (Some of the individual enterprises in this category are very capital-intensive). Two sectors, Construction (no 5) and Trade, Catering, Accommodation (no 6) are still more labour-intensive than Manufacturing. The COR of no 5 has increased steadily until 1987, while that of no 6 exhibited no decided trend. The COR series of no 8 – Finance, Insurance, Real Estate, Business Sector – describes two cycles incorporating a long term slightly upward trend ending in a peak of 4,59 in 1993 (after a nadir value of 3,73 in 1969), while that of no 9 – General Government – traced out a continuous upward movement to reach 6,26 in 1997, after averaging 3,72 during 1960-69.

Among the sectors in Table 9.1 four stand out as the capital-intensive ones: no 8 (Finance, etc.), no 9 (General Government), no 7 (Transport, etc.) and no 4 (electricity, etc.). When their COR's are weighted with the respective growth rates of their capital stocks, and compared to the weighted values for the other five sectors, they emerge as a significant source of capital intensification to be attributed to changes in the sectoral composition of the national capital; superimposed upon the deepening of capital within six of the nine sectors.

Since many parastatals (Transnet, Eskom, Telkom, Postal Services, Armscor, Denel, Mossgas, Atomic Energy, Rand Water Board, Iscor (before privatisation)) are counted among the industrial heavies and exhibit a COR, at 6,9, four times that of the private sector a shift of capital formation in their favour raises the capital intensity of the national economy. Prinsloo and Smith have calculated that the shift, at its peak by 1981, has been responsible for a

forfeiture of some 15 per cent of potential output "on account of the diversion of the nation's resources in favour of parastatals" (p 43). The distribution of the capital stock among three types of organisations for select years, as displayed in Table 9.2, testifies to this.

TABLE 9.2
DISTRIBUTION OF CAPITAL STOCK AMONG THREE ORGANISATIONS

	1960	1970	1981	1997
General Government	20,4	24,3	24,7	26,0
Public Business enterprises and corporations	28,9	29,5	35,1	24,2
Private Sector	50,7	46,2	40,2	49,8
	100,0	100,0	100,0	100,0

Sources: SARB, 1994, 1998.

It is seen that the share of parastatals increased to 35,1 per cent in 1981, reducing that of the private sector to 40,2 per cent, down from 50,7 per cent in 1960. (As a result of privatisation a discontinuity in the historical series occurred between 1989 and 1990 as a result of privatisation, so that the 1997 and 1981 figures are not commensurable).

Demographic needs, as defined above within the domain of the concept "demographic capital", are associated with one labour-intensive sector, Construction, and three of the four capital-intensive ones, in which parastatals are playing a major role; Finance, Insurance, Business Services (no 8) being the outsider. If these three are considered representative enough of demographic capital the germane COR, according to data for the years 1990 to 1997, is 6. (The addition of Construction reduces it to 5,5). Which denotes that the satisfaction of demographically induced wants requires capital-intensive modes of production. If such satisfaction were to be a prime consideration —for example, when it has been written into the constitution as a human right with the implication that government has to assume responsibility, regardless of whether or nor the beneficiaries are able to meet the cost – it would absorb a great deal of economic resources which, otherwise, would have been available for the formation of production capital which, of course, also has to provide for needs arising from population tendencies. And the amount of labour that can be accommodated per unit of capital is curtailed.

9.2 QUANTIFYING THE EFFECTS OF POPULATION TRENDS

To obviate repetitious referencing it is to be noted that the aggregated quantities presented in the identities and equations below have been based on data provided by the SARB (1998 and previous issues), The National Productivity Institute (1997) and Sadie (1983, 1988, 1991, 1993, 1994).

To demonstrate the role of capital (K) in the output (Y) needed for the economic accommodation, in its entirety, of the South African population, recourse is had to the incremental capital-output ratio (ICOR) which defines the number of K units required to produce one additional unit of Y. Using small letter-*d* to denote, for ease of typographical presentation, all kinds of change, whether arithmetic differences or in differential calculus (including partial differentiation), we have

$$\frac{dK}{dY} = k \text{ (ICOR)}$$

Accordingly $dK = k \cdot dY$

and $$\frac{dK}{Y} = k \cdot \frac{dY}{Y} = k(g)$$

where g stands for the rate of growth of output, and $\frac{dK}{Y}$ represents the amount of capital formed in any year, or other period, expressed as a percentage of GDP. The rate of growth in output can be divided into two portions: one to accommodate population growth (n) at the constant income per capita, and the other, to add to the per capita income (y).

Thus $$\frac{dK}{Y} = k(n + y)$$

This simple formulation gives expression to the logic that a high rate of population growth detracts from the portion of output, generated by capital, that can raise living standards. This effect, which is also dependent on the level of the ICOR (k) can be illustrated by quantifying the magnitudes in the above equation for three periods, selected for their intra-period homogeneity of growth rates of K per capita of the South African population, as follows:

1946-1976 : 3,3% per annum
1976-1984 : 1,93% per annum
1984-1994 : -0,93% per annum

Riding on the prosperity phase and crest of the (long cycle) Kondratieff the *per capita* capital endowment of the South African population expanded by 3,3 per cent per annum during 1946-1976. The rate dropped to 1,93 per cent during the first eight years of the protracted period of Kondratieff stagnation, and ended in ten years of diminution in *per capita* endowment. This downtrend could not but impact adversely on living standards, as quantified in Table 9.3.

TABLE 9.3

K FORMATION, THE ICOR AND POPULATION GROWTH

Period	$\frac{dK}{Y}$	k	g	n	y
	%	%	%	%	%
1946-76	12,4	2,70	4,58	2,57	2,01
1976-84	11,1	4,19	2,65	2,50	0,15
1984-94	3,26	4,00	0,81	2,24	-1,43

Sources: Derived from SARB, 1994, 1998.

During the prosperous years 1946-76 the capital formation at a rate of 12,4 per cent of GDP, and a low ICOR of 2,70 could accommodate, with facility, the 2,57 per cent growth in population and permit of a rise of 2,01 per cent per annum in income *per capita*. The latter figure was reduced to 0,15 per cent per annum during 1976-84 when the 11,1 per cent rate of capital formation was accompanied by more than a fifty per cent increase in the ICOR, to produce economic growth barely enough to maintain living standards. When capital formation fell to 3,26 per cent of GDP during 1984-94, while the ICOR declined slightly, income *per capita* diminished at a rate of 1,43 per cent per annum. Actually the impoverishment was almost continuous since 1981. For comparative purposes, if the growth rate of the White group prevailed for the total population, the increase in GDP would have been just about enough to have maintained average income.

Since the LF is directly related to the size and growth of the population, the link between k and the population can also be established by specifying, as per tradition, that the GDP level is determined by the harnessing of combinations of capital and labour (L); thus

$$Y = f(K, L)$$

Differentiating the function with respect to time we arrive at

$$g = e_K r_K + e_L r_L$$

where g is the rate of change of aggregate Y over time, e stands for elasticity and r for rate of increase (decrease). While there has been a slight reduction over time in the elasticity of Y with respect to K, it has been close enough to 0,4 to render this statistic appropriate for illustrative purposes. The value of e_L assuming constant returns to scale is, accordingly, 0,6. (The production function involved is discussed below.) When these two values are applied to r_K and r_L respectively, where L refers to the labour force in the aggregate, not the number employed, we have the following results for g.

Period	$e_K r_K$	+	$e_L r_L$	=	g
1946-76	,4 X 5,98		,6 X 3,3		4,37
1076-84	,4 X 4,41		,6 X 2,84		3,47
1984-94	,4 X 1,15		,6 X 2,9		2,2

The values of g do not agree with the actual GDP growth rate because number employed and labour force (LF) size do not coincide. Their significance arises from a comparison with r_L, which reveals the expected outcome, namely, if capital formation occurs at a lower rate than the increase in the LF (1,15 per cent per annum versus 2,9 per cent during 1984-94) the latter will not be accommodated in the labour market by an adequate rate of economic growth, unless compensated for by a lowering of the ICOR and/or the wage rate. Unemployment ensues. The situation will be exacerbated if not constant returns to scale ($e_K + e_L = 1$) but diminishing returns are experienced. As long as the value of e_L is less than one the growth of the LF alone cannot provide the required employment, although it is possible, particularly in a subsistence economy, that the ensuing poverty can be distributed among a "fully employed" labour force.

Rapid population growth, by way of an equally high or higher rate of increase of the LF, could potentially redound to the benefit of capital formation. This can be demonstrated by means of a single linear homogeneous production function corresponding to constant returns to scale (with omission of an efficiency parameter), viz.:

$$Y = K^a L^b \text{ (with } a + b = 1)$$

Partial differentiation with respect to K yields the marginal

product (MP) $= \frac{dY}{dK} = a\left[\frac{L}{K}\right]^b$

and e_K $= \frac{dY}{dK} \cdot \frac{K}{Y} = a$

equally the MP of L $= \frac{dY}{dK} = b\left[\frac{K}{L}\right]^a$

and e_L $= b$

The first of the two marginal products tells us that the larger the (effective) supply of labour relative to that of capital, the higher will be the returns to the latter, and the greater will be the inducement to invest (form new capital). The ICOR, being the inverse of the marginal

product, will be correspondingly lower, each additional unit of K thus producing larger amounts of output. Economic growth is promoted.

For this outcome to be realised a very important condition has to be satisfied, viz. that the demographically determined supply of labour - the LF in the aggregate - is to be permitted to have an unfettered influence on the wage level which should reflect the relative abundance of this factor of production, while the relatively scarce capital has to have its scarcity reflected in its price and returns. The price of capital (P_k) should be in inverse proportion to its supply (Q_k) and so should the price of labour (P_L) be inversely proportionate to its supply as represented by the LF in the aggregate (Q_L); that is

$$\frac{P_L}{P_K} = \frac{Q_K}{Q_L}$$

Capital will be allowed to act, by and large, as a complementary factor of production, raising the GDP. This is not permitted to eventuate in South Africa at the lower end of the skill hierarchy where large surpluses of labour obtain. Trade unions intervene to sever the nexus between the demographically determined supplies of unskilled and semi-skilled labour and the number affecting the wage level. They appeal, publicly, to the unemployed not to compete with them. They campaign for a "living wage" which bears no relation to the marginal product of L. This living wage, when enforced by strike and other action, has to be generated by the employer who, in pursuit of maximum profits in the private enterprise (or capitalist, or free market) system, minimises his cost by satisfying the condition.

$$\frac{dL}{dK} = \frac{MP_K}{MP_L}$$

To raise the MP of L to the level of the wage demanded and procured by the trade unions, in the absence of any improvement in labour productivity *per sè*, he has to increase the amount of capital in the hands of each worker, thus substituting scarce capital for abundant labour and compensating for inefficiency instead of creating new wealth. The demographically determined supply of labour is not allowed to have any beneficial function at all. Its only role is to add to unemployment. Rapid growth of the LF, which was, at 2,9 per cent per annum during 1984-94 faster than the population growth of 2,25 per cent per annum, has become pure economic baggage, divested of any potentially beneficial attribute, at least as far as the lesser skilled labour (classes III and IV) was concerned.

The average returns to capital stock, as measured by the net operating surplus, changed as follows, the periods having been selected for their intra-period homogeneity of annual values:

1946-1950	:	16,9%
1951-1969	:	14,6%
1970-1975	:	12,6%
1976-1981	:	10,1%
1982-1994	:	7,5%

Sources: SARB, 1994, 1998.

In this downward progression of the rate of return there were years during the 1970s and 1980s when the price of K was at fault in that the rates of interest, in real terms, became negative by reason of their being exceeded by the rate of inflation, rendering K a relatively inexpensive factor of production. This would have favoured some substitution of K for L, but it still boosted K formation in its complementary role to raise the GDP and employment, but at the cost of diminishing its yield because the average product of L ($^{Y}/_{L}$) did not rise *pari passu*. Diagramming the $^{Y}/_{L}$ and $^{K}/_{L}$ time series – relating to the private economy – on a linear scale, we find that the gradient traced out by the two magnitudes in index form, 1990 = 100) was almost the same until the beginning of the seventies, but thereafter the average yearly index point additions of the latter were more than twice those of the former, as follows:

	$d(^{Y}/_{L})$	$d(^{K}/_{L})$
1946-50 to 1970-75	0,94	1,04
1970-75 to 1982-94	0,95	2,31

These magnitudes, which are congruent with those of the National Productivity Institute (1997, p 9) for the private economy, disclose that after the middle of the 1970's both $^{Y}/_{L}$ and $^{K}/_{L}$ have moved upwards, but the latter more so than the former. The productivity of employed labour did not increase in proportion to the amount of capital put at its disposal. The time series published by the SARB (December 1998, S-145), relating to the economy and the LF (employed and unemployed) in the aggregate, on the other hand, would inform us that both $^{Y}/_{L}$, from its peak in 1980 until 1994, and $^{K}/_{L}$, from its peak in 1983 until 1997, declined, but the former by 2,14 and the latter by 1,21 percentage points per annum. From which it is to be deduced that the product per member of the LF declined by more than the amount of capital per LF member; a conclusion which is not inconsistent with that signalled by the private economy. (The trend signs of the two sets of concurrent series differ, but the correlation is positive in both cases). The divergence in trends should, by inference, be attributed to the public sector and the widening gap between LF numbers and the number of employed.

However, since the values in the SARB's $^{K}/_{L}$ series diminished after 1983 they would appear, at face value, to intimate a substitution of labour for capital. Such inference is not to be drawn. Since $^{K}/_{L} = {}^{K}/_{Y} \times {}^{Y}/_{L}$ the downward movement of the capital/labour series resulted from a decline in the product per member of the LF as reflected by the $^{Y}/_{L}$ – ratio.

Wright, et al., distinguishing four categories in the manufacturing sector: capital-intensive, intermediate capital-intensive, labour-intensive and agriculturally-based industries, analysed their respective performances in five periods with regard to value added, total factor productivity and labour productivity. The performances differed from one period to the next and from one category to the next. It was, however, clear that in the intermediate and the labour-intensive categories capital deepening was the major source of increase in labour productivity, and they exhibited negative values for all three attributes mentioned above during 1981-1990. It was the capital-intensive category which propped up the performance of manufacturing in the aggregate (1993, p 2).

The levels of returns to capital, since the second half of the seventies, were constrained by the Kondratieff phase of economic malaise and stagnation (Sadie, 1989). But the burden of this economic retrogression was borne by capital and not shared by labour in employment. At 7,5 per cent during 1982-1994 its rate of return was just about one-half of what it was during 1951-1969. The marginal returns to K between 1951-69 and 1982-94 were, in fact, only 4,7 per cent, and between 1976-81 and 1982-94 it was down to a negative rate, -1,1 per cent. Not only does it not constitute an inducement to form capital (invest), but it invites capital consumption. Instead of such consumption, or in addition to it, workers have been retrenched. In a country overflowing with huge labour surpluses this has the appearance of the absurd. Scarce capital was (is) increasingly substituted for abundant labour rendered scarce in the labour market by trade union contrivance as part of a campaign, at the beginning, to wrest political power from the minority government, and later, apparently, to wrest economic control from the predominantly Euro-oriented employer group.

The economy, not allowed to make use of all its resources, suffers. Standards of living are reduced. Unemployment proliferates, in tandem with the proliferation of human numbers.

9.3 CONCLUSION

For the South African population labour-intensive industries would be the logical economic recipe. The considerations are the familiar ones, apart from the basic premise that factors of production are to be used in proportion to their supply: the restricted domestic market for some products, which means the absence of the economies of scale required by a high ICOR; the labour-intensive industries produce a quick return to investment to act as incentive for

modernisation; they put the lesser skilled workers in contact with modern economic activity; capital-intensive industries can drive up wages, sending the wrong signals to the rest of the economy, and they could require high level manpower not available in the country. However, as in the case of technology, the principle is not an exclusive prescription. South Africa's natural resource endowment, in combination with the world at large as a market, renders some capital-intensive industries candidates for exploitation despite labour abundance. They bring in foreign exchange, generate large savings for re-investment and serve as a focus for the stimulation of modernisation. But in the last resort, the argument that the productivity of capital equipment is not culturally neutral expresses an important consideration.

By means of a planning model based on the 1986 Social Accounting Matrix (SAM) Wang and Mullins (1988, p 27) estimated the impact of capital expansion in 24 sectors of the economy as represented by the marginal $^{L}/_{K}$ (persons per R1 million investment), and the marginal $^{Y}/_{K}$ multipliers, and the decrease (increase) in the inequality of income as reflected by the Gini-coefficient. They established the following sectoral priorities for optimising the use of scarce capital, all of them conducive to a diminution in inequality of income:

		$\frac{dL}{dK}$	$\frac{dY}{dK}$
1.	Agriculture	35,9	0,71
2.	Wearing apparel	66,0	0,53
3.	Leather & Footwear	52,6	0,52
4.	Wood & Furniture	52,7	0,51
5.	Construction	56,9	0,51
6.	Community services	96,7	0,54

It seems only logical that in capital-scarce, labour-abundant South Africa due regard be paid to industries or sectors such as these six in an industrial strategy. The condition to be satisfied is, of course, that relative prices of production factors permit of such strategy. When the cost of capital rises or is raised *pari passu* with supply-unrelated, productivity-unrequited wage increases, the outcome, on both counts, is economic stagnation and unemployment.

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PART II:

DEMAND

CHAPTER 10

THE COMPONENTS OF DEMAND

The demand factors which are to be discussed in the Chapters to follow are itemised in the national accounts of South Africa for the year 1997. The figures in Table 10.1 represent a reconstruction of data published by the SA Reserve Bank in its December 1998 Quarterly Bulletin (S-84, 85, 106, 109, 125).

TABLE 10.1
THE NATIONAL ACCOUNT OF S.A. 1997 IN R'000 000 000

	SOURCES OF INCOME PRODUCED				APPROPRIATION OF INCOME		
(C)	Consumer goods		367	(C)	Household consumption		367
(G)	Government expenditure	195	127	(T)	Government revenue:	173	105
	Less transfers	-68			Less transfers	-68	
(I_1)	Fixed Investment		103	(S)	Private Sector Savings		112
(I_2)	Inventories		-4				
	Error term		-5		Error term		-5
(GDE)	Gross Domestic Expenditure		588				
(X)	Exports, non-factor		165		$M_1 + M_2$		173
(GI)	Gross Income generated		753	(GA)	Gross Income appropriated		753
(M_1)	Less Imports, non-factor		-158				
(GDP)	Gross Domestic Product		595				
(M_2)	Less net factor Imports		-15				
(GNP)	Gross National Product		580				

Source: SA Reserve Bank, 1998. *Quarterly Bulletin,* December (S-84, 85, 106, 109, 125).

Arising from the interaction between the sources of gross income (GI) generated – on the left hand side of Table 10.1 – and the manner in which the income generated is appropriated – set out on the right hand side – we have the following four sources of demand (also called final demand in input-output analysis):

(i) Household Consumption i.e. consumer goods produced and consumed. (The two magnitudes are equal because whatever portion of the former is not consumed is booked to Inventories; while excess consumption is satisfied by drawing on existing stocks);

(ii) Goods and services produced by government (but excluding capital goods which are included in Investment) and revenue collected by government to finance its activities;

(iii) Investment, and Savings to finance it;

(iv) Foreign Trade as reflected by the items Export and Imports.

The equality (in the aggregate) of gross income generated and appropriated is expressed in the definitional equation:

$$C + T + S + M = C + G + I + X$$
$$\text{whence } (C-C) + (T-G) + (S-I) = X-M$$

The amounts furnished in Table 10.1 permit of the following quantification of the magnitudes:

$0 - 22 + 13$ = -9 (in R billions)
which is = GNP – GDE – transfers abroad
= 580 – 588 – 0,5
= -9

This negative amount for X-M signifies that South Africa was (and usually is) a foreign capital-needing country to balance its international accounts.

Proceeding from gross income to gross national product, denoted by Y, we have

$$Y = C + G + I + X - M$$

This identity can be converted into a functional relationship as follows:

$$Y = C(Y) + G(a) + I(a) + X(a) - M(Y)$$

in which (a) indicates autonomous status with respect to the generation of Y, while the insertion of (Y) after C and M imply that they are functions of the determinate Y. A multiplicative economic process arising from the relationship can be demonstrated by means of the partial differentiation of Y with respect to any one of the three autonomous variables, say I, the other two assumed constant, which yields a national product multiplier:

$$\frac{dY}{dI} = \frac{1}{1-c+m}$$

the lower case letters c and m referring to the marginal propensities to consume and import respectively. Arising from the appropriation magnitudes in Table 10.1 the denominator can be converted into t + s + m, with t and s standing for the marginal tax and savings ratios respectively, to yield a multiplier $\frac{1}{t+s+m}$. The three items in the denominator represent the "leakages" that can occur in the process of income generation in that they withdraw purchasing power from the income stream. The higher their values the less vigorous is the multiplicative process. This potentially dynamic can be reinforced by the matrix multiplier arising from the backward and forward linkages in the input-output matrix, when the intermediate inputs receive an impulse from the final demand vector.

In the heyday of Keynesian economics the national product multiplier was used to demonstrate the harmful economic effects of the high savings potential of the mature economies. In present-day LDCs m would probably assume that role, as it has in South Africa.

Recurring positive (negative) impulses provided by the four components of demand – assuming that there are adequate (inadequate) supplies of entrepreneurship to provide the impulses and to respond to the reactive stimuli – lead to economic growth (retrogression). Demographic movements can impinge upon all four magnitudes.

CHAPTER 11

HOUSEHOLD CONSUMPTION

11.1 DIET AND PRODUCTIVITY

Physical well-being is a necessary, even if not a sufficient, condition for the attainment of a satisfactory level of labour productivity. Such well-being requires a minimum of consumption of the means of subsistence. The most basic of the latter is food, the intake of which determines whether enough calories become available to support economic activity. If the minimum just to sustain life without economic exertion is 1 800 calories per person per day while actual consumption provides 2 300 calories, 500 would be available for economic activity. If the average at a person's disposal rises to 2 800, or by 21,7 per cent, the amount available for economic exertion increases by 100 per cent. In this regard the experience of a multinational cement company which established a plant in Africa, as reported by the World Development Forum (1987, p 1), is very instructive. Its production reached only 30 per cent of capacity, labour productivity was 20 per cent of normal and its absenteeism rate 35 per cent. After management had provided a daily high protein meal of milk, meat and vegetables, production tripled, workers gained an average 14 kilograms in weight and the absenteeism rate dropped to 0,5 per cent.

An inadequate diet is characterised by the prevalence of EPM (energy-protein-malnutrition) which occurs when a part of the protein is used to compensate for a lack of energy intake, which leaves less of it to function in support of tissue repair and growth. The absence of meat in the diet of poor countries can be responsible for a deficiency of iron absorption resulting from dependence on cereals and beans for their daily diet. Malnutrition can be measured by the weight-for-age standards as laid down by the National Centre for Health Statistics. In a sample of 20 000 schoolchildren tested during 1980 it was found that of children 6 to 9 years old 2 per cent of Whites, 25 per cent of Asians, 21 per cent of Coloureds and 14 per cent of Blacks registered below 75 per cent of the NCHS standards (Vergnani, 1983, p 9), which suggest that, except for the White/other groups differential, relative income levels were not a decisive distinguishing causal factor (as will appear from the data to follow). Dietary habits would have some role to play. In 1993 some 9 per cent of South African schoolchildren were found to be underweight and 13 per cent stunted in growth (Development Bank of Southern Africa, 1995, p 1). These figures would indicate an improvement if the 1980 and 1993 testing procedures were the same.

11.2 POPULATION GROWTH AND THE MULTIPLIER

Insofar as the per capita income of a community is an indicator of resources available for consumption, population (N) exerts its influence as the denominator in the $Y/_N$ magnitude.

Ceteris paribus, and given that dN is not a stimulus to economic growth which compensates for the effect of the denominator on the average income, the latter is negatively correlated with population size and growth. The lower is $Y_{p.c.}$ the more limited is the ability to save, and the higher the propensity (and marginal propensity) to consume is likely to be. This could be the cause of an income multiplier of potentially explosive dimensions by way of the value of c in the denominator 1-c+m. However, since this would occur in immature economies which do not have the ability to respond to sizeable expansions of demand, the latter will spill over into foreign markets, i.e. the value of m will be so high as to obviate a positive effect on economic growth. Again, in mature economies with slow-growing populations the relatively low value of c (or high values of t+s) will limit the multiplier. Still, allowance has to be made for the probability that consumption (or saving) is not a function of the level of income per capita only.

11.3 FAMILY FORMATION AND AGE COMPOSITION

The *modus operandi* of the demographic forces in the course and composition of consumption is best illustrated by means of an example of family expenditure as affected by the size of the family which, in its turn, reflects the age composition of the population - large families, large percentages of children in the age structure. Our example is based on the expenditure of a two-parent family receiving a Household subsistence level income of R883 per month in Johannesburg as in September 1994 (Potgieter, 1994, p 56).

TABLE 11.1
EXPENDITURE (E) ACCORDING TO SIZE OF FAMILY

Income per family member	Expenditure Total	Expenditure per capita	Distribution of Expenditure			
			Food	Clothing	Rest	Total
R442 Husband & Wife	R507	R254	40,6%	13,6%	45,8%	100,0
+ child 1-3 years	R65					
R294	R572	R191	45,5%	13,5%	41,0%	100,0
+ child 4-6 years	R85					
R221	R657	R164	49,8%	14,1%	36,1%	100,0
+ child 7-10 years	R102					
R177	R759	R152	54,0%	14,4%	31,6%	100,0
+ child 11-14 years	R124					
R147	R883	R147	57,4%	15,1%	27,5%	100,0

There are three forces in operation here. Naturally, as the family expands the amount of income available per member of the family diminishes, to reduce the amount that can be spent on household items per member. This effect is attenuated by the economies of scale materialising as the size of the family increases, which can be associated with the "fixed cost"

involved in the husband and wife base in the initiation of the family, which is being distributed among larger numbers as children, representing variable cost, are being added to the family. But at the same time, these additions reduce the resources available per member of the family. The reduction is exacerbated when the single (parents-children) household, in the tradition of the extended family system, is expanded by the attachment to it of more distant relatives. A Bureau of Market Research sample survey, for example, revealed a per capita disposable personal income (DPI) index ([% of DPI ÷ % of population] x 100) of 71 for multiple households compared to 182 in the case of single households (Loubser, 1990, p 27). The shrinking available income per capita obliges increasing portions of expenditure to be concentrated on life's basics. In Table 11.1 food's share, starting at 40,6 per cent, rises as each child is added to the family, to end up on 57,4 per cent when a six-member family has been completed. With share of clothing and footwear rising slightly it is the residual category which registers the counterbalancing decline.

We can use the data in Table 11.1 to distribute expenditure over the whole spectrum of five-year age groups (x) - adding realistic estimates for the over 65 age groups - and apply to these values the age distributions of the Black (B(x)) and the White (W(x)) populations. The results of the exercise are detailed in Table 11.2.

TABLE 11.2

AGE COMPOSITION AND CONSUMPTION (C(x))

Age	C(x)	Black Population		White Population	
		B(x)	B(x) x C(x)	W(x)	W(x) x C(x)
	R		R		R
0- 4	860	0,146	126	0,069	59
5- 9	1 200	0,135	162	0,079	95
10-14	1 490	0,123	183	0,074	110
15-19	1 880	0,107	201	0,086	162
20-24	2 100	0,092	193	0,086	181
25-29	2 100	0,091	191	0,082	172
30-34	2 100	0,070	147	0,080	168
35-39	2 100	0,057	120	0,075	158
40-44	2 100	0,045	95	0,073	153
45-49	2 100	0,036	76	0,065	137
50-54	2 100	0,030	63	0,055	116
55-59	2 100	0,024	50	0,044	92
60-64	2 100	0,018	38	0,038	80
65-69	1 770	0,013	23	0,032	57
70-74	1 660	0,010	17	0,025	42
75-79	1 660	0,006	10	0,019	32
80-84	1 750	0,003	5	0,011	19
85 +	1 900	0,002	4	0,007	13
		1,000	R1 704	1,000	R1 846

The two ethnic groups have been assumed to have the same HSL expenditure profile by age so that the differences in per capita consumption in the aggregate and in each age group are reflections of differences in age composition only. Because the White population is the older of the two its average per capita consumption is 8,3 per cent, or R142 higher than that of the Black population, reflecting the economies of scale associated with the more youthful population. These economies, at 8 per cent in the above example, are, however, more than nullified by a 17 per cent lesser per capita income producing potential inhering in the smaller productive age component. Only 14,3 per cent of the White group's expenditure is for children under 15 compared to 27,0 per cent in the case of the Blacks. Its expenditure on maintaining the over 65 age groups, however, would, at 8,8 per cent of the aggregate, be two-and-a-half times that of the Black population's proportion. Between 1996 and 2006 consumption is due to be affected by the following projected changes in the numbers of children under 15 and pensioners, the latter considered to be males 65+ and females 60+.

	Children	**Pensioners**	**Total Population increase**
Blacks	+1 357 600	536 600	7 432 600
	= +11,1%	= +37,1%	= +23,6%
Non-Blacks	-146 920	236 010	712 530
	- 5,8%	= +27,8%	= + 7,3%

(Projections by Sadie, 1993, with Blacks' fertility falling more rapidly than that of non-Blacks.) Among non-Blacks there is an expected 5,8 per cent reduction in the absolute numbers of children to be fed, clothed and housed, while the legacy of the past, and continued relatively high fertility (compared to non-Blacks) will raise the consumption by Black children by 11,1 per cent (income per capita constant). In both population categories the influence of pensioners is going to increase - but among Blacks much more so than among non-Blacks - their numbers being due to expand much faster than those of the total population.

We glean information on the consumption pattern of the older generation from Table 11.3, reporting the results of the 1995 sample surveys undertaken by the Central Statistical Service (CSS), which distinguished a category "pensioners". As is to be expected they are less mobile than the average member of the population and, therefore, spend relatively less on transport and a good deal more of their budgets on food and housing. How much of it is due to income differentials cannot be determined. Used as weights in the computation of the consumer price index (CPI) these percentages produce, at any date, indices that may differ from the average CPI based on the consumption pattern of the aggregate population. For example, by October 1998 their index stood at 127,9 (1995=100) while that of the latter was recorded at 128,9 (Statistics South Africa, October 1998, p 15).

TABLE 11.3
EXPENDITURE PATTERNS OF HOUSEHOLDS 1995

	Aggregate households	Pensioners
Housing	22,5	25,4
Food	19,5	23,6
Transport	13,7	9,3
Clothing & Footwear	5,1	4,9
Other items	39,2	36,8
	100,0	100,0

Source: Central Statistical Service, March 1997

11.4 URBANISATION

The movement of people to urban areas and, accordingly, changes in the spatial distribution of the population, can have a marked effect on the level and composition of consumption. This is particularly true when it involves the drastic change from a traditional life in a subsistence agricultural economy to a metropolitan area, where women have cash-earning employment opportunities and where expenditure patterns are changed consequent upon new life-styles. Differences in disposable personal income per capita would, in any case, be a major factor. The Bureau of Market Research found an index of DPI of 103 per metropolitan Black households compared to 27 for the pre-1994 SGT's and TBVC countries with preponderantly rural populations (Loubser, 1990, p 27).

TABLE 11.4
BLACK'S HOUSEHOLD EXPENDITURE ON SELECT ITEMS BY REGION

	PER CENT OF TOTAL EXPENDITURE		
	Metropolitan Areas	**SGTs**	**TBVC**
Food	25,1%	37,7%	40,0%
Clothing, Footwear	10,0%	10,1%	8,0%
Housing, Electricity	6,2%	8,6%	11,6%
Fuel, light	1,8%	3,6%	2,5%
Transport	6,6%	7,9%	7,2%
Alcoholic Bev. & Cigarettes	14,0%	6,2%	4,6%
Support of relatives	8,9%	0,6%	0,2%

Source: Martins, 1994, pp 50, 57, 60.

In Table 11.4 the most conspicuous differences in percentages between the metropolitan and the other two areas, pertain to four items in the consumer budget: (i) food; (ii) housing and electricity; (iii) alcoholic beverages and cigarettes; and (iv) support of relatives. The differences in the case of food and alcoholic beverages, cigarettes and tobacco are a function

of income differentials, while there are two obvious reasons for the showing of housing and electricity, except that electricity would be more costly in rural areas while rural owner-built cottages could merit a higher imputed rent than shacks in urban squatter camps. The extended family system seems to place a more onerous burden on urban dwellers as reflected in the item *support of relatives*. These latter have moved from a situation of underemployment in the rural area, but with subsistence agriculture to fall back on, to a situation of open unemployment and no own means of support.

Urbanisation also brings about intra-item changes as well e.g. diets shift from staple foods such as maize and sorghum to other cereals such as wheat and rice and to processed foods (Pinstrup-Andersen, 1997, p 10), while light and heat will be provided by coal, paraffin and electricity instead of wood.

Concomitant geographic differentials in income elasticities of demand will add to the effect of urbanward movement of people on the composition of household-consumption. The following are examples of such elasticities (for black multiple households):

	Rural Transkei and Bophuthatswana	**Metropolitan Areas**
Food	0,62	0,75
Fish	1,51	0,81
Prepared Food	0,63	1,51
Alcoholic beverages	1,62	1,22
Non-alcoholic beverages	0,34	0,94
Housing & electricity	1,79	0,66
Fuel and light	0,64	0,12
Transport	1,62	1,25
Holidays	0,74	2,47
Support of relatives	1,06	2,23

Source: Loubser, 1990, p 20.

It is seen that for five of the above ten expenditure items the elasticities are lower in the rural areas, and very much lower in the case of holidays and support of relatives.

11.5 DISTINGUISHING BETWEEN POPULATION AND INCOME EFFECTS

Available national consumption data reflect the effect of income levels, income distribution and relative prices, in addition to demographic factors. Therefore, to extract the role of the latter provision has to be made for the influence of the co-determinants. To this end, and ignoring relative prices while income distribution is handled separately, we can revert to the

specification of the functional relationship used in Chapter 7.5.4, and the methodology explained in Chapter 9, and apply the equation representing the growth in consumption.

$$c = e_n r_n + e_y r_y$$

The weights applied to the two determinants, to arrive at an aggregate, when distinguishing between the four ethnic groups, are the shares of these groups in the total South African population and in the aggregate disposable personal income (DPI) respectively. The latter, translated into per capita magnitudes, are presented in Table 11.5.

TABLE 11.5
DISPOSABLE PERSONAL INCOME AT 1990 PRICES IN RAND

	1960 R	1970 R	1975 R	1980 R	1995 R	Increase p.a. 1980-95 %	1995 in 1995 prices R
Whites	12 114	17 260	18 257	17 878	14 992	-1,17	26 086
Asians	2 171	3 674	4 951	5 655	6 231	0,64	10 842
Coloureds	2 000	3 033	3 861	3 933	4 156	0,37	7 231
Blacks	1 033	1 430	1 835	1 903	2 021	0,40	3 517

(Derived from Nel 1975, Nel & Van Wyk 1984, Martins 1989, Martins, *et al.* 1994, Van Wyk 1995 and adjusted to the National Accounts magnitudes.)

What with the great differences in the per capita DPI among the four groups - though there is, of course some overlapping of income distributions - the division of the population in these groups serves the same purpose, in the present connection, as a classification into four income categories. When the 1995 figures in the last column are expressed as multiples of the Blacks' average DPI they feature as follows:

	DPI per capita of total population	DPI per male 15-64
Whites	7,42	5,98
Asians	3,08	2,62
Coloureds	2,06	1,83
Blacks	1,00	1,00

That there is a very large income gap is obvious, with the average White person disposing of an income 7,42 times that of the average Black. This gap has been narrowing, particularly after 1970, the ratio in question having been 11,7 to 1 in 1960. The penultimate column of Table 11.5 indicates that during the period 1980-1995 the average DPI of Whites has been shrinking at a rate of 1,17 per cent per annum compared to increases for the other three

groups, and specifically 0,65 per cent per annum in the case of people of Asian origin and 0,40 per cent for Blacks. The quite significant reduction in the gap when the number of males 15 to 64 is used as denominator, from a 7,42 to 5,98 to 1 White/Black ratio, is at the same time an indication of the consumption arrearage imposed by demographic youthfulness (high fertility), which has an inevitable effect upon consumption patterns. A combination of the demographic and income effects is reflected in the patterns exhibited in Table 11.6. (Some difference in dietary habits can be involved as well.)

TABLE 11.6
DISTRIBUTION, BY ETHNIC GROUP, OF HOUSEHOLD EXPENDITURE AMONG FOUR CONSUMER ITEMS

	Food		Clothing		Furniture		Housing & Electricity	
	1975 %	1993 %	1975 %	1993 %	1975 %	1993 %	1975 %	1993 %
Whites	16,2	14,7	4,8	3,8	4,3	3,3	19,8	18,9
Asians	31,1	25,8	10,0	5,6	4,6	3,7	18,2	16,0
Coloureds	35,3	29,9	11,4	5,6	4,3	3,0	12,5	15,7
Blacks	40,6	33,0	11,2	9,7	6,1	4,6	5,9	7,7

Sources: Nel 1975, Martins 1994, Van Wyk 1995.

The data demonstrate three attributes: the budget intergroup portions spent on basics, food in particular, are inversely correlated with income, and as income per capita rises, smaller intragroup portions are spent on essentials and, correspondingly, larger percentages on non-essentials, while the intergroup differences are also in keeping with those to be expected from population growth and age composition differentials. (There is, however, an anomaly to be observed in the data: the percentage of Whites' budgets spent on food diminished between 1975 and 1993 while their average per capita income had declined.)

Against this background our equation can now be employed to project, over the period 1996-2006, the consumption of food, clothing and furniture, as representative of a non-durable essential, a semi-durable essential and a less essential durable good respectively. The values of the parameters used in the exercise were as follows: r_n = the projected growth rates of the four ethnic groups during 1996-2006; r_y = the rates of increase in the per capita DPI of Asians, Coloured and Blacks experienced during 1980-95, while for Whites it was assumed that the retrogression will cease and income per capita will remain constant so that their r_y = 0; e_y = the income elasticities for the four ethnic groups per item of consumption as computed by the bureau of Market Research (Loubser, 1990); e_n values were determined by means of linear regression analysis assuming C to be a function of N and Y, the national accounts data not permitting us to differentiate among the four groups. These elasticities with respect to population were calculated at 0,92 for food, 0,77 for clothing and 0,70 for furniture. The

exercise pertaining to food is illustrated in Table 11.7 (W represents the weights applied).

TABLE 11.7
RATE OF GROWTH IN FOOD CONSUMPTION: 1996-2006

	$e_n r_n$	W	$W.e_n r_n$	$e_y r_y$	W	$W.e_y r_y$	Total
Whites	0,92x0,47	,127	,055	0,42x0	,480	0	,055
Asians	0,92x1,09	,025	,025	0,71x,65	,040	,018	,043
Coloureds	0,92x1,17	,085	,091	0,73x,37	,089	,024	,115
Blacks	0,92x2,16	,763	1,516	0,80x,40	,391	,125	1,641
Aggregate			1,687				1,854

After repeating the exercise for clothing and furniture the share of population growth in the projected growth in consumption emerged as follows:

Food	91,0%
Clothing	86,1%
Furniture	82,4%

The effect of population growth appears to be overwhelming. If, on the other hand, Whites were to enjoy the same rate of increase in per capita income as the average of the other three groups, the share of population would be reduced to 87,2%, 77,3% and 71% respectively for the three consumer items. Again, if the Whites' income retrogression were to be continued then income would become a negative growth generator, with population becoming responsible for more than 100% of the increase in consumption (in this case by way of the further redistribution of income among the four groups).

The above three examples illustrate the well-known phenomenon that as the degree of essentiality of purchase diminishes, income elasticity increases (e.g. an aggregate above of 0,61 for food and 1,30 for furniture) to raise the effect of income levels, and to render the consumption increasingly labile. And as income per capita rises, more discretionary income is available for the purchase of these lesser essentials which (abstracting from services) are usually more durable in nature. National income statistics underscore the finding that the consumption of essentials and other non-durables is a more stable function than that of the durables and semi-durables.

Large and rapidly growing populations, by restraining or reducing income per capita, can therefore, be conducive to economic stability. A demographically dominated demand function presents the entrepreneurs with a more predictable market, that is, involving lower risks, and should be conducive to investment to satisfy the demand, compared to an income-dominated demand function. But more likely than not this stability will be conceived in poverty, which

does not prevent instability originating in supply, when the latter is preponderantly dependant upon natural resources and consequently, on meteorological conditions, with alternating periods of poverty and food shortages, or even hunger.

An exercise was carried out (de Lange, 1986) to discover what the effects would be if, starting from a position representing the South African economy as reflected in the Social Accounting Matrix (SAM) values, and assuming a constant GDP, the aggregate private consumption pattern were to change to that of (i) the White and (ii) the Black population.

TABLE 11.8
PERCENTAGE CHANGE RELATIVE TO SAM VALUES

	Change to White Consumption pattern	**Change to Black Consumption pattern**
Total Imports	1,48	-3,52
Total employment	-4,50	8,41
Black employment	-4,90	9,09
Agriculture	-14,82	25,70
Total consumption	-8,21	15,39
Savings	2,94	-5,57
Government revenue	9,39	-18,13
Financial Sector	12,11	-23,32

It can be seen that a switch to the Black consumption pattern can have some beneficial effects in that imports will be reduced, employment, and particularly Black employment, will be raised, while agriculture will experience a greater demand. It is, of course, an exercise in static analysis, no allowance being made for the dynamics involved in the implied disturbances to the economy. As it is, Table 11.8 indicates an adverse effect on the financial sector, a substantial decline in government revenue on which the Black population is heavily dependent by way of the redistribution of income through the budget, and a reduction in savings consequent upon the rise in the consumption level. Economic growth in the long run is a function of capital formation, investment that is, which can be constrained by a dearth of savings. Inasmuch as the higher consumption function will imply greater pressure on the food supply, it will exacerbate the inflationary bias of the South African economy. For example, while the consumer price index in the aggregate rose from 100 in 1990 to 169,9 by April 1995, the food index increased to 201,8 resulting from unfavourable weather conditions amidst rapidly growing population numbers (CSS, 1997).

11.6 THE GIST OF THE EVIDENCE

The gist of the evidence is that while a slow-growing or growth-stagnating, demographically old, population – at least before the stage where the productive age group is diminishing in relative numerical strength – can experience some potentially prejudicial economic defects (within the consumption frame of reference), these latter are accompanied by compensatory favourable effects.

The obverse applies in the case of the fast-growing youthful population: it incorporates some potential economically favourable characteristics which are negatived by economically detrimental attributes: It tends to have a high propensity to consume in which life's basics, such as food and other non-durables – having as feature a high population elasticity and low income elasticity of supply – plays a major role. The potential dynamism thus introduced into the economy (a high value for l-c in the multiplier) tends to be neutralised by a high value for m. There are economies of scale to be realised in the expansion of family size, but they are accompanied by diminishing resources available per member of the family (which has as counterpart fewer breadwinners per 100 family members or dependants). And the economic stability imparted by the demand for goods, subject to a high population elasticity of demand, becomes a non-desideratum when experienced as stability in stagnation and demographically induced poverty.

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CHAPTER 12

GOVERNMENT

12.1 GOVERNMENT FUNCTIONS

The role of Government in economic activity-demand is reflected in the nature of the functions undertaken by governments, at the first, second and third tiers, as depicted in the main items of expenditure set out in Table 12.1 (in current prices).

TABLE 12.1

EXPENDITURE OF GOVERNMENT BY FUNCTION

	R Million		Percentage of GDP		Increase per annum
	1992 R million	1995/6 R million	1991/2 %	1995/6 %	%
A General Administration	10 248	16 026	3,2	3,2	11,8
B Defence	11 399	12 039	3,6	2,4	1,4
C Public Order	9 770	16 187	3,1	3,3	13,5
D Social Services	48 412	82 441	15,2	16,5	14,2
Education	22 505	38 037	7,1	7,6	14,0
Health	10 849	16 973	3,4	3,4	11,8
Social Security	8 926	17 201	2,8	3,4	17,8
Housing	1 507	1 898	0,5	0,4	5,9
Other	4 625	8 332	1,4	1,7	15,9
E Economic Services	14 954	19 343	4,7	3,9	6,6
F Interest on debt	14 643	30 574	4,6	6,1	20,2
G Other	1 479	2 637	0,5	0,5	15,6
AGGREGATE	110 905	179 247	34,9	35,9	12,8
(Gov. transfer to households)	(11 900)	(20 945)	(3,7)	(4,2)	(15,2)

Sources: Central Statistical Services, 1993, 1998; SA Reserve Bank, 1998.

What with 1995/96 data being the latest available (at the beginning of 1999) for purposes of comparison with those of preceding years, the 1999/2000 national budget figures were used as a check on whether the 1991/2 – 1995/6 period reflected a trend that might have been continued. In the case of Housing, Table 12.1 appears to emit the wrong signal: the rate of increase would have been higher than that recorded above, while expenditure on health has not just kept pace with change in the GDP but has grown faster (RSA Budget Speech, 1999/2000).

The four main categories of expenditure distinguished in Table 12.1 are: I Administrative costs (including general administration, defence and public order); II Social Services (Education, Health, Social Welfare and Housing); III Economic Services; IV Interest on public debt (which is unallocable to any specific function, but whose dimensions are only surpassed by those of education). All of them can be affected by demographic movements, particularly when the latter permit of the acquisition of economic power through political power. Those that are most directly affected are dealt with below. However, since there has been a discontinuity in governance after the 1994 election, we need to enquire briefly into the demographic base of the attainment of political power by the new government and its policy orientation, which are determinants of its handling of governmental functions, as they were in the case of the previous government.

12.2 POPULATION COMPOSITION AND THE NEW GOVERNMENT

Government, as the expression of political power, is closely associated with population numbers, and probably the only economic sector where pure numbers can accord great or some financial benefit to some, if not all, members of a community In a majoritarian system of government, with universal suffrage, no qualification other than being 18 years or older is required. Large numbers with a common grudge, which can include privation caused by the proliferation induced by high fertility, represent the source of success of politicians. In a reasonably homogeneous society, in the sense of subscribing to a more or less common lifestyle and cultural values, political power and the concomitant economic power, is limited by the probability of changes of government in that minority parties can become majority parties by mustering enough support to oust the incumbents. These conditions do not obtain in South Africa. A tyranny of numbers can ensue.

TABLE 12.2
POTENTIAL NUMBERS OF VOTERS IN SOUTH AFRICA

	1946	1994	1999	2004
Whites	1 519 000	3 800 000	3 980 000	4 116 000
Asians	146 000	669 000	734 000	820 000
Coloureds	567 000	2 116 000	2 344 000	2 569 000
Non-Blacks	2 232 000	6 585 000	7 058 000	7 505 000
Blacks	4 272 000	16 204 000	19 231 000	22 079 000
Black majority	2 040 000	9 619 000	12 173 000	14 574 000

Table 12.2 spells out the "political arithmetic" (the title of a book by Petty published more than three centuries ago) of South Africa. The potential Black voter majority has been increasing 4,8 times during 1946-1994, and will continue to expand. In April 1994 this majority (36 per cent of them illiterate) was allowed to assert itself in a national election. Given its cohesive forces: common culture (though lifestyles of urban and rural dwellers differ somewhat), common skin pigmentation, common experience of discrimination which forged apartheid into a powerful rallying point, widespread poverty - to an extent induced by the same factor which produced the growing majority - and the 1994 election results were a foregone conclusion. The outcome can be veritably described as political power through the cradle. Similarly, the growing majorities of the National Party after the 1948 elections were, for the most part, a function of the faster growth of the Afrikaans speaking population (Sadie, 1958, p. 8). The change in government, when it occurred in 1994, was perceived by the losers, used to self-determination, as analogous to the subjugation of one nation by another. Which was why political scientists had advocated a consociational form of government, as opposed to the Westminster style.

Soon after taking office the ANC/COSATU/SACP alliance government (at that stage still called the government of national unity) issued a White Paper on Reconstruction and Development (RDP) which was proffered as "a vision for the fundamental transformation in our society" (Republic of South Africa (RSA), 1994, par 1.5.2) which, according to the preamble, contributed by the new president, would permeate every level of government, every department and every public institution" (p (i)). The Reconstruction and Development Programme was to be seen as an attempt to change the course of history which has been "one dominated by colonialism, racism, apartheid, sexism and repressive labour policies" (par. 1.2.1) the result of which was "that poverty and degradation exist side by side with modern cities ... our income distribution is racially distorted ... rural areas were divided into underdeveloped bantustans and well-developed white-owned commercial farming areas ... in commerce and industry, conglomerates, dominated by whites, control large parts of the economy ... segregation in education, health, welfare, transport and employment left scars of inequality and economic inefficiency", etc. (para. 1.2.1, 1.2.2, 1.2.3). These conditions apparently constituted "a crisis created by apartheid" which could only be reversed by a comprehensive approach (par. 1.2.6) which encompasses the meeting of basic needs, developing human resources, building the economy and democratising the state and society. Wide-ranging measures were proposed including the reconstruction of the public service – a primary instrument in the exercise of political power – in which affirmative action had to ensure that its staffing was going to be "representative of all the people of South Africa in racial,

gender and geographical terms" which required that "present rules governing qualifications for positions and for salary notches are reviewed" (par. 5.6). However, "attacking poverty and deprivation will be the first priority of the democratic government" (par. 2.7) which, for all practical purposes, meant the amelioration of poverty among its party supporters.

To this end the main instruments of income redistribution – the national, provincial and local budgets and fiscal policies – were brought into play. For a start, an RDP Fund was established with an initial budget appropriation of R2 500 million which was to be raised to R12 500 million per annum after 1997/8, to finance projects which would have the greatest impact on the communities. They served, by way, among others, of providing basic needs and facilitating job creation. But of greater significance in the longer run, is the prerogative of government to use fiscal policy and the composition of its budgets to transfer resources from one group to another, year after year.

The RDP was followed by numbers of Green and White Papers, discussion documents, laws and political speeches intimating, or spelling out, the specifics of fundamental transformation which, in time, turned out to mean the establishment of dominion over all walks of life and spheres of influence "from sports to economic activity, so that they would emit an Africa character" (Tsedu, 1999, p. 14). Transformation has also been dubbed a "public relations buzz word ... more appropriately viewed as a desire to monopolise the spoils of office" (Christianson, 1999, p. 20). According to the government's chief of Communication Services, transformation comprised "the extension of the national liberation movement's power over the defence force, the police, the bureaucracy, the intelligence structures, the judiciary, parastatals, the public broadcaster, the central bank, etc., etc." (Du Toit, 1998(b), p. 14). Asked in an interview what he wished to transform, the ANC Secretary-General replied: "Everything. We still have judges appointed by the National Party" (Retief, 1998, p. 10; Paton & Schmidt, 1998). And in a policy document the non-elected alliance partner, COSATU, pleaded for a socialist orientation in economic policy and significant state ownership (Du Toit, 1998(b), p. 17).

Running like a thread through all expressions and implementations of government policy is the premise of a unique (uni-dimensional) causality founded in the actiology of apartheid as the root of all ills of South Africa; which renders nugatory any further enquiry into justification or legitimacy.

Accordingly, government action after the 1994 election can be viewed as attempts to fulfil their election promises to their supporters, seeking restitution for disabilities they were subjected to in the past, political patronage, nepotism, and maximising their political power. The result of such action on the magnitudes identified in Table 12.1 are superimposed on those emanating from demographic forces, thus heightening their effect.

12.3 ADMINISTRATIVE COSTS

One can conceive of a potential curvilinear relationship between administrative costs per capita and population size, the diagrammed regression tracing out a U curve, manifesting economies followed by diseconomies of scale. Dao, analysing the cross-sectional data of 105 countries, found the size of government as measured by the share of government consumption (which is much more comprehensive than administrative costs) in GDP, to be negatively correlated with population size (economies of scale) though for one group of 64 countries the coefficient was not significantly different from zero. His analysis also indicated a positive relationship between the degree of urbanisation (where externalities may be in action) and size of government (1994, pp 8-11). In South Africa the situation has been dominated by political policy which created new government structures by granting ten Black Homelands self-governing status, starting with the Transkei in 1963, to relieve the perceived political pressure exerted by the growing numerical preponderance of Blacks on the non-Black community. (Four of them later requested, and were granted, political independence). The new governments set about, diligently, creating their own civil services partly as a means of generating jobs in the absence of alternative opportunities in the private sector. This did not prevent the government sector in the rest of the country (the "Common Area") from expanding further.

TABLE 12.3

NUMBER OF CIVIL SERVANTS

	1970	Per 1000 of Popula-tion	1984	Per 1000 of Popula-tion	1994	Per 1000 of Popula-tion	1998 June	Per 1000 of Popula-tion
Self-governing territories			126 850	18	259 780	28		
TBVC countries			126 200	21	258 500	34		
Common Area			890 100	47	985 530	43		
Aggregate	649 500	29	1 143 150	35	1 503 810	37	1 570 230	36

Sources: Adapted from CSS 1986, 1994, March 1995; SSA Oct. 1998.

Table 12.3 informs us that the number of civil servants at central, provincial, regional and local level increased from 29 per 1 000 of the population in 1970 to 35 in 1984 and 36 in 1998. (The last figure means that there was one civil servant for each 28 persons in the population.) Between 1984 and 1994 the government sector of the Common Area expanded somewhat more slowly than the population, while in the self-governing territories and the four TBVC countries it more than doubled in size, to raise the numbers of civil servants per 1 000 of the population from 18 to 28 in the SGTs and from 21 to 34 in the TBVC countries. In addition, the governments of the latter, according to the Auditor-General (RSA, RP141/1997, p. 34), had been overpaying their employees to the extent of R1 469 million over the period 1 July 1991 to 31 March 1995.

The cost of government for South Africa as a whole, as measured by government consumption's share in the GDP, after having been contained within narrow limits up to the beginning of the 1960s, increased rapidly thereafter; from R656 per capita in 1961 to R1 431 in 1994 (at 1990 prices). (SARB 1994(a)). These figures, however, encompass much more than administration as defined at the beginning of this Chapter. But administrative costs per capita too, rose drastically; from an estimated R151 in 1960 to R322 in 1984 and R431 in 1994 at 1990 prices (SARB, 1994(a) and (b)). Some 90 per cent of the 1984-1994 increase is attributable to violence, the expenditure on public order and safety having risen by 120 per cent at constant prices.

To identify the probable role of population in government, as represented by government consumption per capita, an exercise in multiple regression was carried out[1] by way of an adaptation of Dao's specification of the determinants, in a functional relationship: $\log C_g = a_1 + a_2 \log Y_{p.c.} + a_3 \log U + a_4 \log N$ in which a_1 is the intercept, $Y_{p.c.}$ the GDP per capita, U the percentage of population urbanised, N population numbers and C_g government consumption per capita. To provide for possible autocorrelation inhering in the relationship both OLS and Cochrane-Orcutt procedures were employed. For two of the periods distinguished the D-W values were actually higher in the case of the OLS procedures. The data series revealed two transitions or "structural" changes: the G series remained trendless until 1961 after which it moved monotonically upwards, and the $Y_{p.c.}$ series was moving ever upwards until 1981 after which the trend was reversed. It was accordingly considered appropriate to distinguish the following periods for analytical purposes: the period 1947-1994 in toto, 1962-1994, 1947-1961,

1962-1981 and 1982-1991. For the aggregate period 1947-1994 the following equation emerged, with t values in brackets:

$$\log C_g = -2{,}921 + 0{,}578\ Y_{p.c.} = 1{,}124U + 0{,}895N$$
$$(7{,}19)\ (7{,}69) \qquad (5{,}32)\ (22{,}17)$$
$$R^2 = 0{,}993 \qquad D\text{-}W = 1{,}765$$

The 1947-1961 regression produced no significant coefficients at the 5 per cent confidence level. The elasticity of C_g with respect to the three independent variables (at the 1 per cent level) emerged as follows:

Period	Y	U	N
1947-1994	0,578	-1,124	0,895
1962-1994	0,555	-0,614	0,847
1962-1981	-	-	1,004
1982-1994	0,451	-	0,520

The negative elasticities of the U factor of -1,124 for the 1947-1994 period and -0,614 for the shorter period 1962-1994 would indicate the presence of economies of scale in the urbanisation process. Ignoring the 1982-1994 period, government, in per capita terms, expanded at almost the same rate as population, the relevant elasticity ranging between 0,847 and 1,004, and was boosted, until 1981, by rising incomes per capita exhibiting coefficients of higher than 0,5. This is in keeping with our preceding observations of an exploratory nature.

12.4 EDUCATION

As is evident from Table 12.1 *education* represents the largest single item of government expenditure under the heading of *social services*, and has been allocated an amount equalling 7,6 per cent of the 1995/6 GDP. It is the domain where quantity and economic quality of human beings are in direct, immediate and explicit conflict: economic resources used to accommodate the former detract from the amount available to enhance the latter.

There are a number of reasons why government intervenes in the provision of education:

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[1] The technical aid provided by Professor B W Smit of the University of Stellenbosch, Department of Economics, is

- It is considered a human right which some members of the community cannot afford to exercise. The new government is, in a sense, providing free schooling by proxy: no child may be refused admission because of his/her family's inability to contribute financially. This constitutes income redistribution at a secondary level. Parents who desire the maintenance or raising of standards at schools, attended by their children, contribute to school funds for, among others, the appointment of teachers not paid for by the state in terms of the 35 to 1 and 40 to 1 pupil/teacher ratios. Which means that they subsidise the non-contributants a second time; the first being by way of taxation. Demands of periodically demonstrating Black students on university and technikon campuses have the flavour of attempts to secure a similar dispensation at tertiary institutions, which, furthermore, should apparently cease to operate as meritocracies, governed by a majority of representatives of past and present achievers - alumni, students and faculty functioning as a *praesidium meriti*, institutions of academic excellence seeking after objective truth in the Eurocentric (or Western) tradition. Instead, their governance should be in the hands of the majority group in the population, faculty membership should reflect this majority, and *standards* should mean "meeting the needs of the people" which would imply the non-refusal of admission to students on grounds of inadequate academic qualifications and the incapacity and/or unwillingness to afford tuition fees.

- Education is an aid in the engendering of an enlightened citizenry who can exercise reasoned and reasonable choices which promote social order. Literacy and enlightenment can, among others, render the citizens more amenable to persuasion to change their reproductive behaviour in favour of small families. The inverse correlation between education level and fertility is well established, although a curvilinear association at the lowest levels has been observed in some countries (Martin, 1995, pp 187-202). Raising the level of literacy has also been found to be much more cost effective in reducing mortality than spending on unstructured economic change (Preston, 1978, Sommers, 1992, p. 10). Even so, direct spending on family planning programmes is yet cost effectively superior to expenditure on education as a means of reducing population growth (Population Reports, 1985, p. J-762).

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gratefully acknowledged.

– Regarded as human capital formation which can raise the national product, education can engender beneficent externalities in that the social marginal product of the educated (and trained) may exceed their private marginal product (as manifested by their remuneration in the market). The market rate of return (r) to education is determined by comparing the present value (PV) of the series of incomes or wages (W) over a working lifetime (n years) of two individuals or groups of persons, one of whom received t years of effective education more than the other, but incurred the costs involved in those t years, which equal the direct expenditure plus wages foregone (E).

$$\text{Thus} \quad \text{PV for group 1} \quad = \quad -\sum_{1}^{-t} \frac{E(t)}{(1+r)^{t}} + \sum_{t+1}^{n-t} \frac{W^{1}(n-t)}{(1+r)^{n}}$$

$$\text{PV for group 2} \quad = \quad \sum_{1}^{x} \frac{W^{2}(n)}{(1+r)^{n}}$$

We assume that the probabilities of surviving by age are the same for the two groups, and that they are all beneficially employed during their working life. The internal rate of return is determined by hypothesising that PV (1) = PV (2). But there is no simple relationship, with a minimal standard deviation, between education and income and between these and differential marginal productivity. Some of the differentials may be a function of conventions, historically established. To cite an extreme example, an illiterate receives a much higher salary as a member of parliament than a specialist physician in the civil service. Then again, trade unions can use monopoly power to exact wages which have no relation to marginal productivity, and none at all to demographically determined supply of labour. And the educated unemployed produce no return.

Moreover, education is not a homogeneous entity, but encompasses a wide spectrum of quality which would, concomitantly, fetch different prices in the labour market, even though the title of the certificate, diploma or degree may be the same.

TABLE 12.4

EDUCATIONAL INDICATORS BY ETHNIC GROUP

	Government Expenditure per pupil		Pupil/ Teacher ratio	Qualified Teachers %	Primary/ Secondary pupil ratio
	1990	1995	1990	1990	
Whites	4 478	5 473	19,0	98	1,5 to 1
Asians	3 012	4 710	21,7	98	1,7 to 1
Coloureds	2 180	3 829	23,3	59	2,8 to 1
Blacks	926	2 173	40,2	37	2,7 to 1

Sources: Adapted from IFR 1994 October, The Education Foundation 1992, 1993, 1994.

Table 12.4 furnishes us with transparent indicators and proximate determinants of differential qualities of education. Going down the columns from White to Black we have decreasing expenditure per pupil - though the maximum differential has diminished from 4,8:1 to 2,5:1 between 1990 and projected 1995 - increasing pupil/teacher and primary/secondary pupil ratios and decreasing quality of teachers as manifested by the percentages of teachers qualified (Std 10 plus at least 3 years of appropriate training). It was estimated that by 1995 the percentage of under- and unqualified Black teachers had declined from 63 per cent to just under 50 per cent. Equally important are the qualifications of the Black school-leaving population, as represented by the following 1993 Std 10 examination results:

	Mathematics		**Science**	
	% writing	**% passing**	**% writing**	**% passing**
Whites	64	61	44	43
Asians	72	58	40	39
Coloureds	43	33	22	21
Blacks	26	7	15	8

Source: The Education Foundation 1994

It is clear that 92 - 93 per cent of Black schoolchildren leave school without the passport to scientific degrees at tertiary educational institutions, the professions and highly skilled jobs. Of those writing the Std.10 examinations, 39 per cent passed in 1991, one-fifth of them obtaining matriculation exemption. The pass rate peaked in 1994 at 48,5 per cent, but dropped back to 43,4 per cent in 1995 (Editorial Staff, 1995, p. 2).

The productivity of the Black school system can also be judged by the performance of a complete annual cohort of schoolchildren. In 1991 18 per cent of the 1990 school population were reported to be repeating their standard (The Education Foundation, 1994), and the annual rate seems to vary between 17 and 18 per cent compared to 6 per cent Coloured and less than 3 per cent for Asian and White children. It does not, however, tell us how many times a cohort of children starting their school career would repeat their school grade (standard). For an indirect estimate of the importance of failed candidates who repeat, we apply the principles of the mortality table to the 1990 and 1991 statistics on school attendance by grade. The results of the computation reveal that the expected successful years of school life, as indicated by non-repetition, at the start of the school career, of the average Black pupil, are 4,5. In the absence of failures the expected years would number 6,45. Which means that repetition of school grades is responsible for loading the school population by 43 per cent (6,45/4,5 = 1,43), in the absence of which, given the total amount spent by government, expenditure per pupil would have been R1 323 instead of R926 in 1990 and, if the same proportions held in 1995, R3 107 instead of R2 173. Or, given the amount spent by government per pupil, R2 130 million would have been added to the cost of education in 1990 and R5 834 million in 1995.

Apportionment, among the proximate determinants of the difference in government expenditure per pupil, as between Black and White school children, yields the following result for 1994:

Proximate determinant	%
Non-teacher costs	17,0
Excess repeaters	10,8
Lower qualifications of teachers	22,8
Higher natural increase	36,7
Residual	12,7
	100,0

It is seen that more than a third of the expenditure-per-pupil differential was due to the higher level of natural increase among the Black population. In the absence of such excess their P/T ratio could have been very close to that of Whites, given the number of teachers actually employed in 1994. The higher incidence of grade repetition among Black pupils and the lower qualifications of their teachers (therefore lower salaries) were responsible for a third of the differential, while non-teacher costs (facilities in and around the schools) together with the residual accounted for the remaining (almost) one-third.

TABLE 12.5

POTENTIAL SCHOOL POPULATION AS % OF POPULATION AGED 20 - 64

	Primary Education Aged 6 - 13		Secondary Education Aged 14 - 19	
	1991	2001	1991	2001
	%	%	%	%
Whites	20,4	16,9	17,1	14,2
Asians	29,6	23,5	22,5	18,8
Coloureds	34,0	27,3	26,0	21,4
Blacks	46,8	39,1	29,3	26,8

Sources: Sadie, 1993.

The demographic forces are heavily stacked against progress and success on the part of Black children in the field of education. Making provision for an extra year in both the primary and the secondary school age groups, it is seen, as portrayed in Table 12.5, that the economic burden as reflected by the dependency ratios of Black children of primary school age is 2,3 times that of White children, and in the case of the potential secondary school population 1,7 times. Among all ethnic groups the dependency burdens will decline but their relative positions as projected to the year 2001 will differ very little from those of 1991. Given equality of per capita income for those 20 to 64 years old, Black parents (pro forma) would have economic resources of only 49 per cent of those available to White parents and two-thirds of those available to Indian parents, to support a child at primary school. In respect of children of secondary school age the proportions are 59 per cent and 70 per cent respectively. Assuming equal percentage direct contributions by parents to their children's education (or, of course no contribution by anybody) government's subsidies per Black family will be twice that to be paid to a White family or 1,64 times that expended per non-Black family. And the smaller the direct contributions by the large families the greater the degree of cross-subsidisation will be. In 1993 the private expenditure per child figured as follows:

	Primary Pupil	Secondary Pupil
Whites	R2 164	R3 176
Asians	524	1 030
Coloured	578	692
Blacks	456	852

(The Education Foundation, 1995, p. 9)

These amounts testify to the secondary level of income redistribution, as mentioned above, entailed in the obligatory admission of children whose parents cannot pay school fees.

The projected population allows us to quantify the expected changes in the enrolled primary and secondary school population between 1991 and 2001 as follows with enrolment ratios (repeats included) remaining at their 1991 levels:

	Primary school	**Secondary school**	**Total**
Whites	-61 100	-45 600	
Asians	-6 100	1 600	
Coloureds	2 200	14 000	
Non-Blacks	-65 000	-30 000	-95 000
Blacks	826 200	909 700	1 735 900

If, now, the proposed 40 to 1 and 35 to 1 pupil/teacher ratios in primary and secondary schools respectively are going to be put into practice between 1996 and the year 2001 the implications for the number of teachers required during the period 1991 to 2001 are as follows:

	Primary school	**Secondary school**
Whites	-10 005	-8 280
Asians	-2 408	-1 916
Coloureds	-9 840	670
Blacks	36 642	8 500

The required number of teachers in Black Secondary schools rises from 8500 to 61330 if enrolment ratios were to increase to 100 per cent. These data are the most conspicuous evidence of the differences in past and future fertility. And, as is to be expected, the educational scene is completely dominated by the Black population, the only group of which the accommodation of significant additional quantities will have to be catered for, detracting from the resources available for improving the quality of education. Given limited resources and a promise of free and "equality" of schooling for nine or ten years for all, this is the reason for raising the pupil/teacher ratios to which the non-Black pupils will be subjected to. Also Black secondary pupils would suffer as a result. The most likely outcome is a deterioration in the quality of schooling. The interests of progress and achievement will not be served. And some non-Black teachers will lose their jobs since they are unlikely to be used to accommodate the proliferating Black pupils. The relatively privileged position of non-Blacks in pupil/teacher ratios had a *noblesse oblige* element to it in that it provided achievers and the entrepreneurship responsible for the economic progress of South Africa. By dint of differential fertility the economic burden,

on the small-family groups, of cross-subsidisation is due to increase further, even while the ability to do so will diminish.

Even without the downgrading of pupil/teacher ratios the demand for teachers for White and Indian pupils would still decline, but then by 4 923 instead of 22 609 as a result of their low and declining fertility. While they could convert the diminishing fertility into the improvement of the quality of accommodation, the government had to spend increasing amounts of resources just to cater for additional quantities of Black pupils. If the Black population had followed and were to follow the same fertility path as the Coloureds, their teacher requirements by 2001 would be 66 130 and 25 460 fewer for primary and secondary schools respectively[2]. And the number of teachers who had to be used in 1991 for accommodating the derived "excess" quantities of pupils could have been employed to reduce the P/T ratios in 1991 from 44,9 and 31,5 at primary and secondary schools to 31,3 and 27,6 respectively. If, in addition failed candidates who repeated had not raised their school population the P/T ratios could have been down to 26,8 and 21,0 respectively in 1991, given the enrolment percentages of non-repeaters.

This is a classic case of quantity reducing quality, which cannot but be reflected in the future economic progress and national product of the country. The quantitative factor has another side-effect. With the official promotion of English as medium of instruction, at the expense of Afrikaans (and other indigenous languages) (Edusource Data News, July 1996, p. 8; July, 1998, p. 7), the crowding-out process in integrated schools can potentially deprive Afrikaans speaking pupils the opportunity to receive education in their mother tongue. If, in addition, the quality of education prevalent in many Black schools (Makhasi, 1995, p. 17; McMagh, 1996, p. 13) were to be transferred to the transformed schools, the minorities will be subjected to a system which will deprive the economy of some high quality human resources.

In the economic-demographic situation South Africa finds itself, raising the P/T ratios as a means of providing basic literacy to all children of school going age is sensible. But the situation demands greater emphasis on elitist education, not less. What with a dearth of economic growth-creating human material, gifted children who represent potential leaders in all spheres of life, and especially the economic sphere, need to be selected for special attention and required financial support in their educational careers from, say, grade 10 upwards. Economic progress is not about

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[2] Which implies that there would have been a reduction in absolute numbers of children of schoolgoing age.

quantity, but quality, and specifically as portrayed by the attributes spelled out in Chapter 6. It is not generated by proliferating numbers demanding university education as a human right without an obligation to satisfy the required entrance qualifications and to pay tuition fees. (There used to be an Office for gifted and talented children, chairman J.L. Ormond, which pleaded the cause of elitist education.)

The new government could, of course, not escape the problems posed by rapidly expanding school and university populations; problems which have been exacerbated by generations of school children unaccustomed to discipline, and a lack of experience in governance and, accordingly, a limited capacity to cope with them. The backlog of classrooms seems to have remained at an almost unchanged level since 1993, causing overcrowding and a lowering of teacher efficiency. A 15 member audit team, led by the director-general of the Department of Public Service and Administration, reported, among others, that "the implementation of the voluntary severance packages was ... resulting in a lack of skills and expertise ... there had been poor management of the redeployment of teachers and this had an adverse effect on the teaching profession ... five provinces experienced a shortage of teachers ... there was a lack of proper procedures to ensure effective control in the acquisition of textbooks and stationery. Consequently, theft and fraudulent practices had occurred ... although technology education is to be part of the Curriculum 2005, some provinces have no resources for schools, no training programmes for teachers and no strategies in place for implementation..." (Edusource Data News, July 1998, p. 5). One province had 5000 ghost teachers on its payroll (p 14). And at a conference on outcomes based education (OBE) – as in Curriculum 2005 – the American 'godfather' of OBE in the United States told the delegates that the system was an ideal and "was not working anywhere in the world" (Edusource Data News, December 1998, p. 10). To attempt the realisation of such an ideal, when just coping with the practicalities of growing numbers in the educational system, is already a challenge of formidable proportions, cannot be considered sagacious transformation.

The matriculation pass rate for schools country-wide had declined from 58 per cent in 1994 to 47 per cent in 1997. In one-fifth of schools, the success rate was lower than 20 per cent, and a few hundred schools did not produce a single successful candidate (Van Zyl, 1999, p. 16).

12.5 HEALTH

While not easily verifiable, the potential benefits of good health can at least be hypothesised. It lengthens the working life of a person, adding to the years in which a worker can contribute to the national product. In Chapter 2 we have learned that between 1960 and 1991 the working life expectancy of White and Black males at age 15 was extended by 3,3 and 3,2 years respectively. It was also indicated, however, that the potential economic benefits were more than nullified by the decline in the duration of economically active life. It stands to reason that a healthy worker could perform better in the workplace than one who has less energy and stamina and is troubled by periodic absences from work because of recurring illness, or longer lasting ill-health. Apart from the saving of days of disability by the treatment of common ailments of universal incidence, the combating in particular of the malaria mosquito has not only saved millions of lives but also averted millions of man-years of impaired working life. Effective treatment of bilharziasis and trypanosomiasis (caused by the parasite carried by the tsetse fly) had similar beneficial effects.

When ill health, particularly in the form of psychosomatic afflictions, is prevalent among the initiators of economic growth, the managerial staff, the effects on the economy are likely to be the most severe. The higher stress levels to which they are subject diminishes the quality of their performance. A sample survey conducted among South African executives indicated that 85 per cent of them were in need of measures to improve their health (Rothnie-Jones, 1996, p.7).

When the WHO defines health as "a state of physical, mental and social well-being" it represents a type of *summum bonum* or supreme test which encompasses rather more than the notion shared by a majority of people, which is the absence of ailments and infirmity, and which is adequate for our purposes. With the paucity, or absence of morbidity statistics to contend with, we have to rely on mortality data as proxies for assessing the health status of our population. Which confronts us with the problem that we cannot be sure whether increased life expectancy is the result of improvements in health status or a prolonging of impaired life by the advance in medical technology and knowledge, i.e. without a mitigation of maladies. It seems judicious to assume that both elements are involved.

TABLE 12.6

MORTALITY DATA 1991-96

	Life Expectancy at Birth	IMR	Annual Deaths Total	Infants	%	TFR
Whites	73,2	9,0	43 200	3 240	7,5	1,73
Asians	68,2	11,8	6 400	236	3,7	2,29
Coloureds	62,6	32,3	27 500	2 460	8,9	2,37
Blacks	63,2	55,0	236 100	53 200	22,5	3,96

Source: Adapted from Sadie, 1993.

Table 12.6 reveals very sizeable differentials in expectation of life at birth, the maximum stretching to 10 years. The most sensitive index of health conditions, the infant mortality rate (IMR) features even larger differences e.g. 55 per 1 000 births for the Black population versus 9,0 among Whites, producing 22,5 per cent and 7,5 per cent respectively of the total deaths experienced by these two population groups. The South African Demographic and Health Survey (DHS) has found the following four factors to be the statistically significant determinants, at the 1 per cent level, of infant mortality: age of mother at birth of child, birth interval, mother's education and the material standard of living. The inverse association between the IMR magnitudes in Table 12.6 and the per capita income data in Table 11.4 certainly provides support for the finding about the fourth determinant. But purely demographic factors involved in fertility can have an appreciable effect on the level of the IMR as well. The DHS revealed a relative risk of mortality among children born to mothers 10 to 14 and 15 to 19 of 233 and 121 respectively, with that of mothers aged 20 - 34 set equal to 100, and rises to 283 when mothers reproduces at age 40-44. With the relative risk for births spaced two to three years taken as 100, those associated with an interval of 1½ to under two years and with intervals shorter than 18 months are 153 and 270 respectively. After the fourth birth the IMR increases from 45 per 1000 to 158 per 1000 for the ninth and higher parities. And infant mortality was found to be 3,3 times as high among parents experiencing low standards of living than those placed in the high standard category (Rossouw & Hofmeyr, 1990, p. 39).

To discover the effects of the above mortality-raising reproductive behaviour on the IMR we apply the relevant ratios to the high-fertility Black community. The results are in the form of the reduction in the IMR if the behaviour in question did not eventuate:

(i) If the rate of births of teenage Black mothers equalled that of the Coloured community their IMR would have been 2,2 per 1000 lower;

(ii) If reproduction did not continue beyond the third child 90 800 births would have been averted and the IMR reduced by 6,7 per 1000;

(iii) If all births occurred at intervals of two years and longer infant mortality would have been 12,7 per 1000 less;

(iv) If the Black population had the age structure (and thus the dependency ratio) of the lower-fertility Coloured community, the resultant improvement in per capita income could have reduced their IMR by 2,8 per 1000.

In sum, in the absence of the above demographic forces the IMR could have been 24,4 per 1000 lower, or 30,6 instead of 55, and some 23 600 out of 53 200 annual infant deaths averted. Or, more simply, if Black mothers had manifested the same age-specific fertility rates as Coloured women, 396 500 births could have been averted annually during 1991-96, conducing, at an IMR of 55, the avoidance of 21 800 infant deaths. In this regard Hobcraft (1992, p. 29) has found that the gains in the saving of children's lives through family planning "can never be huge, since the population attributable risks rarely exceed 40 per cent... [but] are nevertheless worth realising". Kintner, analysing the decline in the IMR of Germany over the period 1871-1925, found that the "reduction in marital fertility was responsible for most of the infant mortality decline ... Smaller family size changed the allocations of food within households and reduced the number of children per dwelling which led to reduced transmission of infectious diseases" (1994, pp 127, 129).

We observe in South Africa, essentially, an economically inefficient reproductive system. Time, energy and money are absorbed in the creation of economically excessive life, much of it, as indicated above, of a non-viable character. Every year almost one million Black women are subjected to the consumption of the bodily nutrients occasioned by pregnancy, a probable reduction in energy and the curtailment of the capacity for economic activity. This, together with the duties imposed by the nurturing of children at home, may account for the very high rate of absenteeism experienced by the clothing industry, in which women predominate, viz 1,81 days per month or 21,7 days per annum on average (Gool, 1996, p. 18). (In fact, when this number of days is added to the public holidays and an annual three-week holidays, these women will not be working for 10 weeks (2½ months) out of a 52 week year, or almost 20 per cent of the time.)

Since absentees are members of teams of workers, the loss of productivity and production is compounded by the repercussions on the processes handled by co-workers.

Given that everybody has access to maternity and related medical services, the burdens imposed on the relevant facilities by different levels of fertility are clearly portrayed in the last column of Table 12.7.

TABLE 12.7

SHARES IN BIRTH (B) AND POPULATION (N) NUMBERS COMPARED. ANNUAL BIRTHS 1991-96

	Birth numbers	B%	N%	$B\%/N\% \times 100$
Whites	72 000	6,3	12,8	49
Asians	19 980	1,8	2,6	69
Coloureds	76 200	6,7	8,5	79
Blacks	967 300	86,2	76,1	112
	1 135 480	100,0	100,0	100

The relative burden of the high fertility community is 1,42 times that of the Coloured community, 1,62 times that of the Asians and 2,29 times that of the group of lowest fertility. With equal expenditure per birth, high fertility raises costs, leaving fewer resources for other purposes, or, with the absolute amount available as constraint, quality of service has to be sacrificed to quantity. If it is assumed that the infants who died received medical care, and we take into account only the preventable deaths (caused, as computed above, by reproductive behaviour) among Blacks, the economic burden imposed by the latter is 1,29 times that of the non-Blacks (in addition to the 1,81 multiple obtaining ($^{112}/_{62}$) in respect of births).

For an incisive analysis of the economic demography of health care one would need to know the incidence of illness in all its variations: according to age, cause and nature, degree of physical or mental impairment, duration and type of treatment (ranging from simple medication to major surgical incisions). In the absence of the relevant morbidity data recourse is to be had to surrogate information. According to the Department of Health (1995) admissions of outpatients occurred at a rate of 639,78 per 1000 and admissions to health facilities at a rate of 62,92 per 1000 of population in 1994. Most of the instances of treatment at home, by private doctors and according to recommendations by pharmacists, would be excluded from these figures.

For a provisional indication of the influence of age structures we can hypothesise that each death was preceded by an equal amount of healthcare in any year. The magnitudes emanating from this hypothesis are presented in Table 12.8.

TABLE 12.8

TOTAL DEATHS AND POPULATION BY AGE

	1991 – 1996			2006 - 2011			
Age	**Mortality rate**	**Percen-tage of deaths**	**Percentage of population**	**Mortality rate**	**Percen-tage of deaths (D)**	**Percentage of Population (N)**	**D%/ N%**
0-19	,0057	29,0	47,7	,0029	16,4	39,8	0,41
20-44	,0034	14,4	35,9	,0027	14,9	38,7	0,39
45-64	,0135	19,5	12,1	,0103	24,0	16,1	1,49
65-74	,0421	13,9	2,8	,0341	17,1	3,5	4,9
75-84	,0974	14,3	1,2	,0745	16,4	1,5	9,1
85 +	,2559	8,9	0,3	,2008	11,2	0,4	28,0
Aggre-gate	,0084	100,0	100,0	,0071	100,0	100,0	

Table 12.8 reveals that a small minority of the population, those 65 years and older, 4,3 per cent in 1991 and 5,4 per cent in 2011, would be responsible for a very substantial portion of deaths, viz. 37,1 per cent during 1991-96 and 44,7 per cent during 2006-2011, the increase reflecting the combined effect of the projected decline in mortality and the ageing of the population (as a result of the decrease in both fertility and mortality). The share of the 0-19 age group, on the other hand, diminishing in relative numerical strength from 47,7 per cent of the population in 1991-96 to 39,8 per cent in 2006-2011, is expected to decrease from 29,0 per cent to 16,4 per cent. All this portends a relatively increasing need of geriatric health services and a diminishing need of paediatricians' services. (The age-related incidence of mortality is strikingly expressed in the statistic $D\%/N\%$ in the last column of Table 12,8, in which the figure for the 75-84 age group is 23 times that of age group 20-44).

The above statistics do not, however, give adequate expression to the effect of age and ageing on health care facilities required: the equal care hypothesis formulated above does not hold water and over time a declining mortality is most likely to ensue from an increase in the use of health facilities and medical treatment. One author has reported shares of the elderly in health expenditure varying from 25-30 per cent in New Zealand, the USA and the Netherlands to 43 per cent in Denmark, while chronically ill elderly persons required physician contact at a rate twice

that of the lowest rates observed (Habib, 1988, p. 206). In Japan the incidence of medical treatment by age ranged, in index form, from 100 per age 0-4 to 44 for age 15-19, to 140 for those 70 years and older, the latter at a cost 4,4 times that of the youngest patients (Ogawa, 1988, p. 263). The South African President's Council (now defunct) reported that most of the state health care resources spent on an individual occur during the last two years of his/her life. The percentage of persons requiring permanent and total physical care rises sharply after age 65 as follows: 7 per cent among those 65-74, 16 per cent among age group 75-84 and 30 per cent for the 85+, and 45 to 50 per cent of provincial hospital beds are occupied by persons 65 years and older (1988, pp 126, 135). If the inferred hospital bed occupancy rates for the 65+ and 0-64 age groups respectively have remained at their 1987 levels, and continue to do so after 1996, the need for provincial hospital beds would rise at a rate of 2,2 per cent per annum compared to an 1,5 per cent per annum increase in the total population, over the 1996-2011 period. That the 2,2 per cent per annum increase is lower than the projected 2,6 per cent per annum growth in the labour force is comforting, but hardly significant when employment of the labour force lags far behind. The elderly will be occupying 56 per cent of beds by the year 2011 compared to 45-50 per cent in 1996. (If the White population's degree of ageing prevailed, the former percentage would be 75 per cent by 2011.) If we make provision for inflation the R233 300 cost of provision of a bed, inferred from the President Council's report (p 128), would have risen to R710 000 by 1996. If the cost remains constant at this level the average annual addition to the total cost of providing beds would be R3 210 million between 1996 and 2011. If we apply the President's Council's percentages relating to the chronically infirm requiring constant care, their numbers will increase at a rate of 2,74 per cent per annum over the twenty year period 1991-2011, which will be a multiple of 1,57 of the aggregate population growth. (The absolute numbers involved are 262 900 in 1991 and 450 800 in 2011).

Additional useful information can be assembled by applying the British morbidity experience by age relating to illness of more than one week (Moultrie, 1996) (which correlates highly with the South African age incidence of disability (SSA, 1998, p. 2.23). The result shows 6 970 000 cases of sickness for 1991 and 11 035 000 for 2011, an average annual increase of 2,3 per cent, or from 185 to 208 per 1 000 of the population; the outcome of a combination of frequency of occurrence and chronicity associated with the ageing process. The elderly (65+) are projected to be responsible for 43 per cent of the increase while contributing 8,7 per cent to the increment in the aggregate population. Because of its having moved furthest in the ageing process, the White population's share in the occurrence of illness, at 27,6 per cent, is out of proportion to its 10,2 per

cent contribution to the 2011 total population. According to the CSS (1995(b), p.4.11) the number of patient-days spent in hospitals remained at just over 37 million per annum for a long period, but after 1983 the number of out-patient and casualty treatments increased from just under 24 million to 30,3 million in 1990. The 1994 October Household Survey (CSS, 1994(b), p. 121) revealed that 12,3 per cent of the population had been ill (duration unspecified) during that month, which, assuming October to be representative, constitutes a case load on an annual basis of 1,48 times the population number. Persons discharged from hospitals numbered 2,3 per cent, or 28 per cent annually. The latter figure would be reduced by demographic ageing which causes an increased duration of hospital bed occupation per average person. Further information provided by the Survey is that the numbers of consultations with doctors, specialists and nurses (annualised) per 1 000 of the population were: Whites 3068, Asians 2838, Coloureds 1 564 and Blacks 1 678; while consultations with traditional and spiritual healers numbered, in the same order: 250, 151, 244 and 938 (CSS, 1994(b), p. 123).

Notifiable diseases apart, our only source of intelligence concerning the nature of illness suffered is the statistics on causes of death. However, deaths among Blacks have been underreported to such an extent, and manifesting such annual fluctuations in underreporting that they are useless, except if we assume that the degree of underreporting is invariable with respect to age of the deceased and the cause of death, which is indeed what we shall hypothesise even if very tentatively. Of the notifiable diseases, tuberculosis stands out, registering, in 1992, an incidence of 212 per 100 000 of population, followed by measles (22 717 cases compared to 82 338 for TB) at 58 per 100 000. During the two year period, 1990-91, 111 207 new cases of cancer or 152 per day, have been recorded (Dept. of Health and Population Development, 1994, pp 34, 44; SA Institute for Medical Research, 1996). The notified numbers of cases of all other diseases have all been fewer than 3 000 in 1992. It is worthy of note that the incidence of TB among the Coloured population is way above that of the other three groups: in 1980, 335 per 100 000 versus 216 among Blacks and in 1992, 662 against 198. It is evidently not only a simple poverty disease. According to the old Department of Health and Population Development (1994) 78 - 79 per cent of TB patients are being cured, while the fatality rate is around 6 per cent, which spelled some 7 500 deaths in 1993 (CSS, 1995, p. 3.19). The number of cases is on the increase, and in the USA a new W mutant drug-resistant strain has been identified.

A disease very much in the limelight since the 1980s is the Acquired Immunodeficiency Deficiency Syndrome (AIDS) caused by the Human Immunodeficiency Virus (HIV), particularly

since it is linked with Tuberculosis. According to the medical adviser to the South African TB Association HIV permits dormant TB bacilli to become active while TB turns HIV infection into AIDS. The virus weakens the human body's ability to withstand the onslaught of TB, as of other maladies (Bassett, 1997, p. 22). In 1998 the United Nations Population Division came up with startling projected figures for the number of deaths ensuing from AIDS in South Africa (UNAIDS, 1998, p. 17). The difference between mortality without and with AIDS shows up as follows in annual numbers of fatalities:

			Annual Additions	
Period	Without AIDS	With AIDS	Number	%
1985-90	332 000	333 000	1 400	0,3
1990-95	337 000	349 000	12 200	3,6
1995-2000	336 000	476 000	140 000	41,7
2000-2005	337 000	746 000	409 000	121,4
2005-2010	345 000	854 000	509 000	147,5
2010-2015	358 000	775 000	417 000	116,5

The vexing question is what to make of these statistics. Do they have the status of projections of greatest or moderate likelihood or of a scenario? By the end of 1998 there has been no overt or conspicuous statistical evidence that South Africa had been experiencing a rise in the death toll of 41,7 per cent involving 140 000 lives per annum. And a 147,5 excess in ten years' time, raising the annual number of deaths by 509 000, seemed even more remote. When the course of the disease is assumed to describe a sigmoid, or s-shaped gamma curve as UNAIDS would have it, the inputs in the model are as much a cause for agonising as are the outputs. The stage on the curve assumed to have been reached by a population at the time of the projections and the infected population base are of crucial importance. The HIV prevalence level, based as it is on the examination of samples of women attending antenatal clinics, elicits some questions: Has there not been a growing propensity on the part of pregnant women to visit antenatal clinics, which could also have entailed earlier identification and thus a longer life expectancy (after identification) for later than for earlier samples of women? Has substitutional mortality been taken into account? How representative are the samples in question? And with regard to the cause of death, has increased consciousness of the disease not led to more circumspect diagnosis?

However, we do not have enough non-conflicting data at our disposal either to refute or corroborate the outcomes of the UNAIDS exercise. But extravagant predictions over a period of

two decades, not supported by subsequent events in South Africa, have conduced to scepticism. The HIV surveys 1991 to 1996 (Department of Health, 1997), would indeed convey a growth rate in the (weighted) incidence of HIV infection of some 50 per cent per annum. But in 1996 (compared to 1995), the high incidence Kwazulu-Natal would apparently have registered a rise of 9,2 per cent only, while the Western Cape and Mpumalanga would have experienced a slight decline, and the national aggregate number of infections have risen by 3,6 per cent. With regard to the AIDS fatality incidence the UNAIDS model projected an annual number of 12 200 deaths for 1990-95, while the official records (CSS, 1993, 1994, 1995 and SSA, 1999), put it at 2 360. When we project the latter figure at UNAIDS ratios of progression we have the following annual average number of fatalities:

1995-2000	27 100
2000-2005	79 100
2005-2010	98 500
2010-2015	80 700

This simple scenario produces very much less alarming results than those of UNAIDS, but are not therefore, insignificant, adding as they do 20 per cent to AIDS-free mortality. The message is that, in the absence of alternative solutions, hospital services will have to prepare for major additional burdens. It should be added that diagnosis is qualified by the rider that cases where AIDS is present, but not the underlying cause of death, are not reflected in the statistics.

By 1998 no cure had been discovered, but the course of HIV can be delayed by means of anti-retroviral therapy, and there are treatments available for opportunistic malignancies affecting persons whose immune system has been weakened by the HIV. Meeting the costs involved is, however, beyond the capacity of lesser developed communities (UN, 1998(b), p. 27). If the numbers of AIDS victims assume the proportions projected by UNAIDS, then just ordinary hospital-care for them would be beyond the fiscal capacity of South Africa. Employers of AIDS victims may also be saddled with very sizeable costs. An AIDS consultant has claimed that for every case a business may incur costs of around R150 000 in medical expenses, absenteeism, death benefits and in the recruitment and training of new staff (Van Zyl, 1999, p. 16). In this instance the high rate of unemployment has the function of containing the direct costs to the economy.

In Table 12.9 are presented the five numerically most important categorised causes of death, before AIDS had become a major issue, and before the practice of differentiating among the four population groups had been terminated.

TABLE 12.9

CAUSES OF DEATH 1989/1990

	Whites	Asians	Coloureds	Blacks
Diseases of the	%	%	%	%
circulatory system	36,1	32,0	23,7	11,8
Neoplasms	18,2	8,5	12,8	7,6
Violence, Accidents	11,2	14,6	16,6	21,6
Diseases of the respiratory system	10,7	7,1	9,7	8,1
Infectious & Parasitic diseases	2,2	3,1	10,3	11,1
Ill-defined conditions	10,2	15,2	11,3	22,0

Source: Central Statistical Service (1990, 1991).

Despite the very high percentage for the ill-defined category, which renders the data suspect, this information and data on age incidence allow of three conclusions: parasitic and infectious diseases are primarily associated with youth, the incidence at age 0 being exceeded only, in the case of Whites, after age 60; deaths by violence are concentrated around ages 20-39 which put great (preventable) pressure on hospital facilities already overburdened; neoplasms and diseases of the circulatory system are positively associated with the biological ageing process, and their contributions to mortality is, accordingly positively correlated with the degree of demographic ageing exhibited by the four ethnic groups. Contrariwise, the relative importance of infectious and parasitic diseases, usually referred to as poverty diseases, varies inversely with such ageing. Table 12.9 shows their relative incidence among Whites to be 2,2 per cent and among Blacks 11,1 per cent. After adjusting for an estimated underrecording of deaths among the latter of 230 per cent, we find that the difference in age structure is responsible for some 60 per cent of the difference in incidence. The provision, in the New South Africa, of free health care services to pregnant women and breastfeeding mothers of infants up to six weeks of age, as well as to children under six years of age, may take the share of the demographically induced incidence differential close to 100 per cent.

While the fee for medical treatment may not be insignificant to the poor individuals, the nominal fees paid by them in state institutions bear no relation to the real cost - borne by taxpayers - and are tantamount to gratis treatment. Any new initiative in health policy would essentially involve

increasing the accessibility of medical care facilities (structures, vehicles, medication, personnel) where there is overcrowding in existing institutions, and by extending them to the remote corners of the country. The 1994 October Household Survey (p 121) furnishes the following data on the percentages of people at various distances from the nearest medical service:

	White	Asian	Coloured	Black	Total
Less than 1 Km	32,0	51,2	50,7	25,7	29,3
1 - 4,99 Km	48,8	36,2	36,7	33,3	38,7
5 + Km	19,2	12,6	12,6	41,0	32,0
	100,0	100,0	100,0	100,0	100,0

These figures relate to both urban and non-urban areas. In the latter 55,9 per cent of the population live 5 km and further away from their nearest facility. It is clear that it is the Blacks, the poorest in the outlying districts, who are in greatest need of easier accessibility, while doctors prefer to practise in the urban areas. Witness the importation of Cuban physicians to fill the vacancies in the remoter areas. The accelerated urbanisation after 1985, apart from natural increase, was responsible for the much increased pressure on hospital facilities because it entailed greater accessibility.

In 1994, 76,4 per cent of Whites, 28,4 per cent of Asians, 24,1 per cent of Coloureds and 9,2 per cent of Blacks had access to medical aid schemes. The latest (1996) estimates put the number of such schemes overall at 180, providing coverage to 2 600 000 members and 7 600 000 dependants and, representing 59 per cent of those employed in the formal labour market earning more than R20 000 per annum (Hudson, 1998, p. 19). The new Act on Medical Schemes stipulates that an applicant cannot be refused membership because of age, race, sex, marital status, ethnic or social origin, sexual orientation, disability or health status, and the premium would be based on his income, number of dependants and average morbidity risk (i.e. of all members). Already in the "closed" schemes, where participation is compulsory for all members of an enterprise or institution, the healthier members are subsidising the less healthy, and the younger members the older ones. Compliance with the new law's requirements will necessitate increases in the contributions of the members in "open" schemes (which differentiated among applicants) which, if large enough, may drive them out of business, and thus add to the numbers who have to be cared for by the State.

The new government has been responsible for a major shift in health services since 1994. The emphasis has been on primary health care: 686 clinics had been built or upgraded during 1994-1998, and a school feeding scheme provided 5 million children with one free meal per day (RSA, 1999). Because of fiscal constraints this entailed a shift of resources away from hospital medicine and academic hospital complexes. In the Western Cape, for example the health personnel has been targeted for a scaling down from 33 300 in 1995 to 21 000 in 1998, while the number of hospital beds had already been reduced by 2 580 between 1995 and 1997 (Benatar, 1997, p. 9). This constitutes, as in the case of education, redistribution in favour of high fertility households. The policy had been decried by medical school academics who, in the nature of their profession, are interested in advancing medical science and fear "an intention of gradually restructuring medical schools into centres for training only primary care practitioners" and that "sophisticated skills built up with dedication over many decades are being devalued ..." (Benatar, Chief Physician at Groote Schuur Hospital, 1997).

It is worthy of note that in previous decades, when fertility levels were at their highest and the more appropriate focus would have been on primary, health care, secondary and tertiary health services were promoted. In the 1990s, when the expected demographic future indicated increased attention to be paid to the latter, it was the former, presented as reparation for neglect in the past, that was accorded priority.

In the absence of the appropriate detailed data it is not possible to put a price tag to the projected health trends. (Which latter had to serve, in consequence, as demographic proxies for monetary magnitudes). There is, however, no doubt that, given the current official health policy, while every patient might claim entitlement to received the implied medicine, the surgical services and hospital accommodation as a matter of a human right, to be effectuated by government, it will not be able to pick up the bill. Already by 1998, many hospitals were suffering from a critical inadequacy: an inability to pay their electricity bills and personnel salaries on time, to protect patients against criminals trying to set free their comrades, to prevent large scale theft of medicines, to provide adequate ambulance services, to cope with the case load because of understaffing, even, in one instance, to provide food for their patients, etc. (Badenhorst, 1999).

12.6 SOCIAL WELFARE AND SECURITY

Included under the heading of Social Security and Welfare we have the following items of government expenditure: old age (or social) pensions, children's maintenance and foster-parent's grants, pensions for the blind, war veterans and the disabled, military pensions and benefits awarded to sufferers from compensatable diseases. In terms of the amounts involved only the first two items assume significant proportions, with old age pensions (OAP) as the predominating item involving an expenditure of R7 114 million in 1994 compared to R938 million for maintenance and foster parent grants (MFPG). The latter encompass grants for children in the care of a natural parent (normally unwed mothers) and grants to adults who take children into foster care. Some of the relevant data appear in Table 12.10.

TABLE 12.10

SOCIAL WELFARE PAYMENTS 1994

	OAP		MFPG	
	Benefi-ciaries	**Amount R mill.**	**Benefi-ciaries**	**Amount R mill.**
Whites	126 458	561,5	39 090	90,9
Asians	34 465	153,0	41 732	104,3
Coloureds	130 000	574,0	238 375	550,3
Blacks	1 311 966	5 825,1	84 731	193,0
Total	1 602 889	7 113,6	403 928	938,4

Source: Central Statistical Service, 1994, pp 6.2, 6.4.

It is seen that MFPG bears no relation to population size or fertility. They can act as an incentive for deliberate or improvident reproductive behaviour, since extramarital births and foster parenting can make a sizeable contribution to a poor family's income. And knowledge of the way in which the system can be turned to good account must play a part, which renders it impossible to project future demands on the fiscus. The number of beneficiaries among the Coloured population, for instance, jumped from 66 452 in 1992 to 238 375 in 1994 and the amount disbursed from R259,6 million to R550 million. One can surmise, on the basis of fertility levels, that if the Black population were to measure up to the Coloured population in their ability of exacting the maximum benefit from the system, the amount paid out to them may skyrocket to well over R6 000 million, compared to the R193 million mentioned in Table 12.10, before taking any future additions to numbers of children into account. However, the system has

been revised by the new government, and the amount granted reduced, to provide each indigent child with a uniformly minimum financial support.

In Table 12.11 the numbers of OAP beneficiaries presented in Table 12.10 are compared to the numbers of persons of pensionable age (males 654, females 60+) to find the proportions of the latter who had qualified after a means test. To determine each population group's contribution to the 1996-2006 projected total increase in beneficiaries it was assumed that the percentage of each qualifying for the social pension of R410 (raised in subsequent budgets) would remain constant at the 1994 level.

TABLE 12.11
PROJECTED INCREASE IN OLD AGE PENSIONERS

	Percentage of Pensionable age persons qualifying	1996-2006 Increment	Percentage Of Total	Increment Percentage Per annum
Whites	22,3	34 100	5,6	2,4
Asians	65,1	20 200	3,3	4,7
Coloureds	82,8	43 100	7,1	2,9
Blacks	95,4	511 900	84,0	3,4
	74,5	609 300	100,0	3,1

The relative levels of the qualifying percentages are in accordance with expectations based on income per capita. While the OAP receivers in the Asian population will be growing fastest their incremental numbers constitute only 3,3 per cent of the aggregate. As in most other aspects of the economic-demographic problèmatique the Black population dominated the scene, contributing 84 per cent to the increment in old age pensioner numbers. The group making a maximum use of the system - as measured by the beneficiary-intensity - compounds the fiscal burden by growing fastest in number (if we leave aside the numerically less significant Asian community), while contributing least, per capita, to the funding of the government expenditure. The demands for redistribution of income are ever increasing. A long-term GDP growth rate of 3,1 % or more to contain the OAP burden, should be considered a target most difficult to achieve in South Africa.

The OAP dependency ratio of 74,5 per cent, as in Table 12.11, might appear very high in light of the 82 per cent of formally employed persons who have been reported as members of private

retirement funds for 1986 (Mouton Committee, 1990, p. 14). This ostensible disparity is explained by the fact (i) that the present situation is the outcome of membership of many decades ago when it was small (in 1970 only 33 per cent); (ii) that only a portion of the labour force (two-thirds in 1986) is employed in the formal sector; (iii) and that there are very sizeable pre-retirement leakages from retirement funds: R270 million in 1980 and R1 550 million in 1988, on an accumulative basis. (Mouton Committee, p. 24). When legislated preservation of pensions was proposed by the Louw committee in 1980 it was vigorously opposed by Blacks who considered the deductions from their wages for retirement funds as compulsory temporary savings only. They also preferred provident funds which allowed the total benefit accrued to be paid out in one cash amount. By the time they do reach the age of retirement there may be little or nothing left of accumulated savings, thus transferring the burden of their continued livelihood to the taxpayer.

If the 1994/95 and 1996/97 budgets have been correctly interpreted, the amount to be paid out in social pensions during 1996 would have been approximately R8 300 million, which would be 17 per cent more than the R7113,6 million in 1994, and would raise the number of beneficiaries from 74,5 per cent to 80,2 per cent of the persons of pensionable age. It would be difficult for the implied 8 per cent annual increase to be sustained in the absence of inflation as a mediator.

It is agreed by social workers that the OAP has much greater significance for Black households than for others. What with high levels of unemployment and poverty the income of R860 per month received by an elderly couple (1995) could be a great deal more than they earned over long periods of their economically active lives. And it is regular and assured. To them old age would mean improvement in living standards when, among non-Blacks, it is likely to spell financial retrogression. On the other hand, it would appear that many of these elderly couples would not be allowed to enjoy the full benefit of the OAP since children and grandchildren would want to share in the largesse. However, this system has the beneficial side-effect of providing obligated family care for the aged, who would otherwise have had to be institutionalised.

There is one great administrative drawback to the OAP scheme: it provides abundant opportunities for fraud and theft. Table 12.1 shows that the financial burden of social welfare, relative to the GDP, has increased over a four year period. The 1999/2000 Budget Speech, however, suggested a levelling off of the annual incremental rate.

12.7 HOUSING

In as much as residential construction is regarded as capital formation in the national accounts, and can therefore be legitimately financed by means of public debt-augmenting loans, it has the advantage of not featuring as an item which contributes to the level of dissaving when undertaken by government. Which means that government has a greater deal of manoeuvrability in the handling of housing than in the dispensing of social welfare, education and other activities to be recovered from current revenue. (It is, of course, assumed that market rates of interest and depreciation are recovered from purchasers/tenants of the dwelling units constructed). This does not apply to the transfer payments in the form of subsidies or grants to assist needy families to acquire homes. Even so, there are few areas of government endeavour in South Africa where the energy spent in researching, analysing, writing, talking, conferring and recommending has met with such scant action as in housing for the poor, since the time of Verwoerd, who did provide adequate accommodation for the shack-dwellers of his day. During 1995/96 almost three-quarters of the funds voted for it in the budget remained unspent. Since then, however, performance on this front has evidently taken a turn for the better. The National Expenditure Survey, which accompanied the 1999/2000 Budget, recorded the construction of 624 449 homes during the period 1994/1998.

The needs of the population with regard to housing - by which is meant one or other type of formal structure, which includes traditional cottages, but not shacks, hovels and shanties - can be estimated, as a first approximation, by applying family headship rates by age and sex - held constant over time so that only population size and structure will be reflected - to arrive at the number of nuclear families. These latter refer to married and cohabiting couples with or without children and single parents. These entities differ from households, which can consist of more than one family as well as non-family members, and from the traditional extended family which can have distantly related members attached to it. In the volume on households in the 1991 Census series of publications (RSA, 1991) a household is defined as consisting "of a person or group of persons (whether related or not) who usually occupy a dwelling, or a part thereof and who provide themselves with food and other essentials for living or make provision for such essentials". From which it follows that an average household does not necessarily comprise a larger number of persons than a family, since the latter must consist of at least two persons, while the share of one-person households in 1991 ranged from 2,8 per cent among Asians to 15,2 per

cent among Whites. Application of the two definitions produced the following results for the projected average number of persons per unit:

		per family	per household
Whites	1996	3,27	2,98
	2006	3,01	2,74
Asians	1996	3,77	4,14
	2006	3,34	3,67
Coloureds	1996	4,37	4,37
	2006	3,90	3,90
Blacks	1996	5,19	4,57
	2006	4,69	4,13

The per household averages for the year 2006 were based on the changes in the average size of families, which reflects the size and structure of population and not any changes in attachments to the conjugal family in the make-up of the household. Both definitions were employed to project the numbers of dwellings that would be needed to house the increase, between 1996 and 2006, in the number of families/households. While the household definition raised the increment by 325 500 units, it produced almost no change in the annual rates of increase. Only the figures pertaining to families are presented in Table 12.12.

TABLE 12.12

NEW HOUSING UNITS REQUIRED BETWEEN 1996 AND 2006

	Number	Annual % increase	% requiring subsidy	Subsidised units required
Whites	215 300	1,26	19	40 300
Asians	70 900	2,28	59	41 600
Coloureds	206 500	2,27	77	159 600
Blacks	2 260 000	3,17	87	1 962 000
Total	2 752 700	2,70	80	2 203 500

To satisfy all needs - not demand - some 275 000 dwelling units have to be constructed every year. To convert the needs into market demand it would appear that 80 per cent of the units, 220 000 per year, will only materialise if their construction is subsidised by government or provided free of charge, with or without the latter's actual involvement in the construction itself; most probably with such involvement. If all four groups could have experienced the same rate of family increase as the White group, the country would be in need of 156 000 or 43 per cent per annum fewer dwellings. These figures do not include the needs generated by the depreciation of existing housing stocks and the backlog. For 1994 the latter had been estimated at 1 300 000

(Holm, 1994, p. 9) though there are as many estimates as there are writers on the topic. The elimination of the backlog plus a 1 per cent replacement construction will imply a two-thirds increase in the annual number of units, or some 458 000 per annum, compared to the 275 000 quoted above, raising the annual rate of increase from 2,7 per cent to 4,2 per cent per annum, and the probable number of subsidised units required to 366 000 per annum.

While (net) international immigration increases housing needs, urbanward internal migration tends to have the same outcome. The cottages or huts vacated in the Black Homelands may not be fulfilling the needs of any additions to inhabitants of the relevant rural areas, while there is not substitution of one cottage for another, since the materials for building a traditional dwelling are not available in urban centres as a free gift of nature. (It is assumed that a shack, hovel or shanty is not graced with the title of a housing unit). Any change from oscillating migration to permanent settlements by undivided families adds to the need of formal accommodation. Arriving in towns and cities without provision for regular living facilities by themselves or government, in-migrants invade public and private land, and on occasion private homes and other buildings, depriving legal owners of their possessions and cramming up to 60 persons in a three bedroom house, the doors of which are often used as firewood (Raghaven, 1996, p. 18). At a minimum the hovels put up by squatters are aesthetically disturbing to the citizenry, or bourgeois, in adjacent areas who had thought that they were entitled to the orderly and attractive environment they had created over many decades. The latter suffer financially when the value of their properties declines as a result of the presence of squatter camps in their immediate neighbourhood, which represents a harassment hazard.

The outcome does not, of course, differ from that of the pressure emanating from the natural increase among the settled inhabitants of urban areas, except that they are not faced with the more dramatic change occasioned by migration.

The rapid growth (3,1 per cent per annum) in the number of elderly persons, as quantified in the section on social welfare, presents a special problem, in that the high incidence of frailty and impairment obliges appropriate living arrangements for those who cannot afford to care for themselves or are not looked after by their children or other relatives. However, because of the proliferating numbers, the need for economising to leave more resources for other government functions, and the fact that Whites were demographically over-represented in state-subsidised old-age homes, the new government's policy on subsidies was calculated to force some of them

out of these institutions and to confine the admission to the most indigent individuals only. In 1996 the subsidies to these institutions have been substantially reduced, threatening destitution to many occupants. As it is, there are severe shortages of accommodation for the elderly, only 2 per cent of them being housed in old-age-homes, while ideally 10 per cent would be the norm (Pretorius, 1995, p.19).

Table 12.12 depicts a by-now-familiar situation: the communities who can least afford the means of living, are responsible, via their rapid population growth for the fastest and largest increase in the need for such means. The growth in Black family numbers is, at 3,17 per cent per annum, two and a half times that of Whites and 1,4 times that of Coloureds and Asians. And while the ratio of increase among non-Blacks decline very substantially between 1991-96 and 2001-2006 - among Asians by as much as 41 per cent - that of the Black population remains almost unchanged at 3,1 - 3,2 per cent per annum.

Financial aid by the government to prospective homeowners to convert needs into demand, is made available (1998) on the following scale.

Monthly income	**Grants-in-aid**
0 - 799	R15 000
800 - 1499	R12 500
1500 - 2499	R9 500
2500 - 3500	R5 000

The government also grants project subsidies to members of a community waiting to erect houses with the help of a developer, co-operative subsidies to qualifiers organising themselves into a group for the purpose of buying or building houses, and social subsidies to charitable institutions, like churches, and companies specially established for building homes to let to those qualifying for grants. Pressure has been brought to bear upon banks to participate in the provision of loans to small-income earners, but they argue that the cost and risk involved in small loans are higher per Rand of small loans than of larger ones. The large majority of persons in need of credit earn less than R1500 per month. The banks countered criticism about their hesitancy or unwillingness to enter the market by pointing out that they were already contending with 50 000 non-performing loans and repossessed properties involving a risk exposure of more than 700 million Rand which militated against the interests of their depositors (Gumede, 1996, p.10). Already (by 1998) a smaller bank had collapsed and been bailed out by government and

another experienced severe liquidity problems. The instalment payments of the mortgages in fifteen Black townships were reported to be R3000 million in arrears during 1996 (Makhari, 1996, p.23; Editorial, Sowetan, 1996). It is not known how much of it arose from an inability to pay, but the tenor of reports on this matter suggests that non-payment is a deliberate decision; a custom that was established during the years (pre-1991) of the Struggle for political power. A National Housing Corporation was established in 1996 to provide in excess of R500 million to relieve the liquidity problems arising from loans to the poorest.

A Western Cape minister of housing has also complained that housing development projects were bogged down in endless discussions and consultations with prospective occupants who refused to entertain anything less than free standing three bedroom houses whose affordability is completely beyond their reach, but which have been conjured up by election promises interpreted to mean that free housing was to be had for the asking.

The cost of providing residential accommodation is not, of course, confined to the expenditure on the construction of living units. In formal housing schemes it includes the preparation of the sites, the reticulation of water and electricity, sewerage and refuse disposal facilities, roads/streets, telephones and public buildings. These constitute the housing related physical infrastructure, sometimes referred to as demographic investments which are capital-intensive by nature.

12.8 FINANCING GOVERNMENT EXPENDITURE

If, because of indivisibilities and external economies, the fiscus were to act in the capacity of an entrepreneur providing publicly produced goods and services on demand (needs backed by purchasing power) at cost-covering prices, fiscal policy and the programme of government expenditure would have presented relatively few problems. But since there are many members of the community who cannot afford the user cost of the goods and services in question, while a social philosophy (as formulated by the politically powerful) would have it that they should participate in the enjoyment thereof, the fiscus becomes a redistributing agent financing its expenditure, or part of it, by means of compulsory levies, taxation, that is. In the result, the merit of an expenditure programme, as in the Reconstruction and Development Programme (RDP) (RSA, 1994) lies not in its grandiosity but in its realism as defined by its affordability. There would probably be relatively few people who would, as a matter of principle, wish to deny others

all the best in the best of all possible worlds. But not if they have to bear the burden of bringing it to fruition in an economically inadequate world, a description which would fit the South African economy vis-à-vis its demographic forces. The satisfaction of needs/wants is confounded by the endemic clash between unlimited wants and limited resources.

The well established redistributive welfare systems are mostly found in First World countries - many of which have had second thoughts on the affordability of their schemes - where the per capita income is relatively high, the Gini coefficient relatively small, the community reasonably homogeneous and most taxpayers receive a reasonable "return" in the form of the allocable portion of government expenditure - on their contributions to the fiscus. To some extent these conditions might have held *within* the White community while they disposed of political and, consequently, fiscal power and exercised control over the transfer of resources to the poorer sections of the population. This power had been steadily eroded before it was finally relinquished in April 1994, in the process of which the dimensions of redistribution had been progressively extended. What with the poorest elements growing fastest in number the redistribution would have continued apace even in the absence of a change in government.

The government of the New South Africa (NSA) tended to present as an innovation their policy which was only an intensification and created the impression that the NSA was regarded as approximating a First World country in which affordability was either not an object of substance or could be realised by transferring the existing amount of resources from the higher to the lower income classes. The RDP is essentially a programme of redistribution which seemed to be considered as a recipe if not proxy for "development", which later was said not to need growth to precede it. "Meeting basic needs", not economic growth, was accorded first priority. A new economic strategy (GEAR) presented to parliament on June 14, 1996 projected the image of a major shift towards growth. Consultants had evidently persuaded the Minister of Finance that a policy of resource-consumption could not be maintained in the absence of resource creation. At the same time the deputy-president was at pains to explain that the RDP remained the "anchor" of government policy and that spending on social services would not be jeopardised. In this regard the presence of four members and two ex-members of the SA Communist Party in the cabinet is not insignificant. A leading ideologist of the party declared that these ministers appreciated that it was not possible to achieve everything at once, but that they would not be daunted by such constraints (Du Toit, 1996, p. 11). And the new president asseverated that the ANC would never part company with the SACP or COSATU. The 1995/96 local elections were

calculated to reinforce, at the local level, the redistributive programme of the central and regional administrations. Under the pre-1995 system persons qualified as voters if they were ratepayers or tenants of ratepayers, the principle having been that representation without taxation in local government, acting as institutions which rendered services at market prices or cost, was not less unacceptable than taxation without representation. In the NSA dispensation the only qualification is a minimum age of 18, permitting sheer weight of numbers to dictate the sharing of resources among communities, as at national level, regardless of their contributions. In newspaper advertisements before the November 1995 elections the public was informed that non-payment of their debts to local governments for services rendered was not a disqualification and should not deter them from registering as voters. Those who wanted to stand as candidates in the local elections were, however, required to settle their debts. Having been elected to the local councils in November 1995, some of them stopped paying their rates and taxes and had to be removed from office after having been in arrears for three months or longer.

By 1996 the non-payment of debts for municipal services, rent, electricity and mortgage bond instalments had become almost a way of life after the ANC, during the years of struggle for political power, had adjured its supporters to act thus to render the Black townships ungovernable by the former government. It has been suggested that these people argued that since they did not pay the authorities which were not of their choice, there was no good reason for doing so now that their "own" government was in power. The Masakhane campaign to end boycotts seemed to have had no more than temporary success, even though, it is claimed (Makhari, 1996, p.23) some R5 000 million debt arrears had been written off as an incentive to boost its chances; after which there have been demands for more cancellations of debts. On October 1, 1996 the Minister of Provincial Affairs and Constitutional Development announced that the accumulated unpaid debt owed to local authorities for rates and service charges amounted to R5 600 million, while Eskom was trying to recover R938 million in arrears from these 95 authorities who did not have enough funds to pay their staff one month's salary (Argus correspondent 1996, p. 5). By the middle of 1999 non-payment for services had been responsible for most of the R12 500 million debt accumulated by local authorities (De Klerk, 1999, p.10). This constitutes a special form of redistribution by direct coercion, the shortfalls having to be recovered from the non-defaulters. (Non-payment by those who have no income to settle their debts cannot, of course, be labelled coercive, but they appear to be a small minority). The differential charges in favour of the poorer communities already contain an element of redistribution. For example, consumers of water and water-borne sanitation in Johannesburg pay

75 per cent of the replacement cost of their services, while in nearby Soweto they are charged less than 25 per cent of the cost (Van Ryneveld, 1994). Some transitional municipal councils after 1994 also operated a system of charging non-cost-related flat rates in Black townships, which gave rise to demands on the part of other consumers to be treated in the same manner, which posed a serious threat to the solvency of these councils.

An attempt was made to quantify the approximate extent of redistribution as revealed by the central government budget of 1993/94 and the 1994 shares of Blacks and non-Blacks in the payment of direct and indirect taxes. A few caveats have to be sounded: differential benefits accruing to Blacks at the local level have not been estimated; realised expenditure has invariably been higher than budgeted amounts; some of the ratios used in the calculations pertaining to ethnic shares relate to 1990 and 1991 (the last years for which they were available) and are likely to understate the resources channelled to Blacks; the personal income distribution by ethnic group computed by the Bureau of Market Research (BMR) had been used because it contained some more of the information required than the calculations of Whiteford and McGrath (1995); and the BMR's figures had to be adjusted to reflect the national accounts data levels as published by the SA Reserve Bank. (These latter are usually subject to revision, so that calculations carried out in any year may not produce exactly the same results as those based on data published in the preceding year). The results are assembled in Table 12.13.

TABLE 12.13(A)

TAX CONTRIBUTION PER POPULATION GROUP (R 000 000) 1994

	Direct Tax	**Indirect Tax**	**Total**	**%**
Whites	37 346	28 120	65 466	66,0
Asians	1 480	2 058	3 538	3,6
Coloureds	2 110	4 605	6 715	6,8
Blacks	4 050	19 350	23 400	23,6
	44 986	54 133	99 119	100,0
Company Tax	14 488	Total tax revenue R113 607 million		
	59 474			

TABLE 12.13(B)

1993/94 ALLOCABLE GOVERNMENT EXPENDITURE ON BLACKS
R'000 000

Social Welfare	9 880
Education	14 340
Health	7 530
Housing	1 850
	33 600
Tax contribution	23 400
Net transfer	10 200

Derived from: Van Wyk, 1989, 1995; Martins et.al. 1994; Lund, 1992; SA Reserve Bank, 1994(a) & (b), 1995, 1996; Central Statistical Services 1994, 1995.

Confining the calculations to allocable government expenditure - which implies that Blacks as in Table 12.13(b), need not be debited with a portion of the cost of general government administration and interest on public debt - the results show a net transfer of resources to them of R10 200 million during 1993/94 yielding them a net return of 44 per cent and a gross return of 144 per cent on their contribution to the fiscus. If it is assumed that they received a benefit from general administration and interest equal to their share in the aggregate personal income of South Africa, they should be debited with R22 260 million; or with R16 440 million if the ratio of their personal income to the GDP is used as reference. Which accounts for a major portion of their tax contributions and which, (the GDP based R16 440 million) when added to their allocable resource receipts, entails gross and net returns of 214 per cent and 114 per cent respectively. For non-Blacks the comparable percentages are 88 per cent and -12 per cent. The implication is that the Black population as a group (intragroup transfers being abstracted from) contributes at a maximum, 21 per cent of the cost of allocable fiscal resources apportioned to them. Because of the disparity in numbers the R364 per capita benefit to the Black population of the transfer of resources imposes a burden of R1159 per person on the non-Black population. Assuming the benefit in 1994 prices to remain the same, the burden will rise to R1447 by the year 2011. In reality, the levels of both the benefit and the burden are increasing as the heightened redistribution of the post-1994 NSA progresses[3].

[3] After the 1999 revision of the national accounts - which significantly raised the levels of previously published GDP and related magnitudes - the SA Reserve Bank (June 1999, p. S-131) reported transfers from general government to households of R17 357 million in cash and R43 084 million in kind for 1994. By 1998 these amounts

Additional evidence of the subsidisation of the Black population can be gleaned from the budgets of the erstwhile TBVCs and self-governing territories. In 1993 they collected R5 185 million in tax revenue within their own borders and received grants from the central RSA-government totalling R23 213 million (SARB, 1994(b), S-97). The latter amount absorbed just about the aggregate amount of tax revenue collected from the whole of this population within and outside the borders of the autonomous and self-governing areas, and is R4 900 million more than collected from this group outside the borders by the central government. In addition the former Homelands left a legacy of a R14 100 million debt to the taxpayers after reincorporation into the NSA.

That the redistributive process has been one of long standing is intimated by McGrath's (University of Natal) finding that the 1975/76 budget reduced the personal income of Whites by 6,9 per cent while raising that of Indians by 3,4 per cent, of Coloureds by 19,2 per cent and of Blacks by 10,6 per cent (Terreblanche, 1980, p. 14).

While at the end of the pre-1994 government's tenure of office South Africa might still have been "near the head of the world inequality league" (Simkins, 1979, p. 9), it had gone a long way towards mitigating the inequality. If it had remained in office, with socio-economic policy unchanged, the demographic forces would have impelled a continuation of the process.

The situation as explained above, coupled with the economically antithetic differential population growth, portends severe problems for the fiscus in financing future programmes of expenditure, even if there were no attempts to intensify the transfer of resources to the lesser endowed. The contention can be demonstrated by projecting government expenditure and tax revenue from 1993/94 to the year 2004 on the following problem-simplifying assumptions: (i) that the per capita allocable expenditure will continue at its 1993/94 level for all four groups; (ii) that general administrative and public debt cost will increase *pari passu* with population; (iii) that per capita personal income, intragroup income distribution and tax rates will remain unchanged; and that (iv) company tax revenue will rise at the same rate as personal income tax revenue. The outcome is presented in Table 12.14.

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had risen to R22 395 million and R69 097 million respectively, in current prices, representing an increase at constant prices (GDP deflator) equal to that of the GDP.

TABLE 12.14

TAX CONTRIBUTIONS PROJECTED TO THE YEAR 2004
R'000 000

	Direct Tax	Indirect Tax	Total
Whites	39 240	29 560	68 800
Asians	1 660	2 300	3 960
Coloureds	2 380	5 190	7 570
Blacks	5 040	24 060	29 100
	48 320	61 110	109 430
Company Tax			15 560
Aggregate			124 990

ALLOCABLE GOVERNMENT EXPENDITURE (R'000 000)

Blacks	41 780		
Non-Blacks	33 300		
General administration and interest	78 940	Tax Revenue	Shortfall
	154 020	124 990	29 030
1994	129 750	113 610	16 140

It is clear that the shortfall in tax revenue is due to increase very substantially (by 80 per cent, from R16 140 million to R29 000 million), as a result of such revenue advancing by just less than 1 per cent per annum, compared to 1,7 per cent in the case of expenditure (all magnitudes in 1993/94 prices) and 1,9 per cent per annum in population growth. This is caused by the fact that the group most heavily subsidised preponderates in number and grows fastest. Their contribution to indirect tax revenue is commensurate with their numbers and is, at 39 per cent, somewhat higher than their 34 per cent share in personal income (because of a higher consumption coefficient) but their payments on account of income tax lag far behind (10 per cent) as a result of their relatively low per capita income. In fact, because of its progressive nature personal income tax contributions in the aggregate are more unequally distributed than the inequality in income. According to data furnished by the Commissioner of Inland Revenue 3,9 per cent of the aggregate population were registered as income tax payers in 1992/93, while 2,1 per cent were responsible for 90 per cent of income tax revenue collected by the IR department. The latter percentage may be raised somewhat by the addition to the ranks of the upper income class by way of Black Empowerment and the political patronage of the new government, which are exacerbating the inequality of income among Blacks, who already manifest the highest Gini coefficient of the four groups. According to Whiteford and McGrath inequality of income within population groups has, by 1991, been responsible for 75 per cent of overall inequality and has

been increasing since 1975 by 28 per cent and 32 per cent among Whites and Blacks respectively (1995, pp 56-57).

The new government has been intensifying redistribution of income between Blacks and non-Blacks by according increasing importance to government services which favour the high fertility section of the population: primary health care at the expense of secondary and tertiary health services; scaling down subsidies to old age homes and frail care centres; shifting teachers from schools of the slow-growing population groups to those of the fastest growing; increasing the emphasis on housing subsidies, etc. The policy is in accordance with the comprehensive list of human rights written into the constitution, the realisation of many of which, in terms of the RDP, implies claims upon the resources of persons other than the beneficiaries. These persons perceive the human rights as entitlements or arrogations. They also interpret the Municipal Structures Act, which confers the power to create megacities on the Minister of Provincial Affairs and Constitutional Development, as a means of adding to the redistributive process at the local government level by incorporating squatter camp and similarly poverty-stricken communities into the administrative jurisdiction of the better-off areas. This will oblige municipalities, which are already responsible for financing some 90 per cent of their costs out of own resources – compared to around 70 per cent in the USA and 30 per cent in Brazil – to raise property taxes to finance the subsidies to the newly incorporated communities. In addition the government was going to change its financial support formula to increase its subsidies to the poorer towns and reduce those of the higher income communities (Coetzee, 1999; Robinson, 1999; Swart-H, 1999). Many township dwellers have also been exercising their own version of redistribution by refusing payment for services provided by municipalities. The Masakhane campaign initiated to bring an end to this confounding of the cost/price system had uneven and, often, temporary success.

In rural areas redistribution is due to be intensified, if the recommendations of the National Land Committee are going to be implemented by way of the transfer of land. It was recommended that vacant land must be gifted to Black persons; that labour tenants should not only have right of residence on farms, but have to be granted full ownership; that "unutilised, under-utilised and indebted parcels of land should be identified and expropriated by the state and redistributed to Black rural people, with priority given to farm workers and labour tenants" (Swart, P., 1999).

In his 1999/2000 budget speech the Minister of Finance emphatically drew the attention of his audience to the fact that "the budget now embodies the RDP" (RSA, 1999), seemingly to dispel the fear that the government might have strayed from the path of redistributive righteousness because of a competing commitment to the market-friendly approach reflected in the GEAR programme.

In 1998 an economist of a group of companies carried out an exercise, at the micro level, to discover the rate of return, on their contributions to government revenue, in the form of government services received by each of three families – all three consisting of four members – with incomes of R300 000, R60 000 and R19 000 respectively. The relevant amounts, per Rand contributed, were found to be 9 cents, 89 cents and 192 cents in the above order. Had allowance been made, as a matter of high probability, that the lowest income family would consist of six members, instead of four, the differentials would have been considerably larger (Roodt, 1998).

The government action reviewed above had to be reconciled with an avowed commitment to fiscal discipline and a goal of income tax relief while avoiding politically unpopular additions to the value added tax (VAT). The severity of the task was mitigated to some extent by the elbowroom permitted by the Defence budget vote which had been reduced by 1,8 per cent per annum between 1995 and 1998. But, as intimated by Table 12.1, economic services became a victim of reprioritising in favour of social services, which meant that the economic infrastructure was not being maintained, thus jeopardising the future growth of the economy. If, as is claimed by the National Expenditure Survey (RSA, 1999), government intervention in Water Affairs and Forestry led to the creation of 100 000 jobs each year between 1994 and 1998, this would be a very substantial positive contribution. However, when almost all sectors of the economy have been registering absolute declines in employment, it is difficult to check how much decline has been averted by government action.

The reprioritising above could not prevent a continuation of the preceding government's practice of having recourse to finance part of current expenditure by means of loans, which, according to the SA Institute of Race Relations, was for the purpose of eradicating "racial discrepancies in government expenditure priorities before 1994" (Finance Week, 1999, p. 7). The resultant levels of dissaving, after having been a modest R1 805 million in 1990 and R4 799 million in 1991, averaged R20 850 million per annum during the three year period 1992-1994 before the new government took charge of the budget and R19 300 million per annum during 1995-1998

(SARB, 1999, p. S-129). When measured against the GDP the latter amount, at 3,4 per cent, represents better performance than the preceding one, at 5,4 per cent. Even so, an annual addition of R19 000 million to the public debt means that each year an additional R2 150 million of government revenue is being pre-empted (by the payment of interest) and not available for social or economic services[4].

If a continuation of the accumulation of such dead weight debt is undesirable, its discontinuation would make demands upon taxpayers which would undoubtedly be considered unacceptable as well. With recourse to higher rates of VAT apparently ruled out, unless accompanied by very substantial additions to exempt or zero-rated items – COSATU, by means of mass action condoned by the ANC, had effectively blocked the raising of VAT in the 1996/97 budget – direct tax (predominantly personal income tax) would have to bear the brunt of the burden of any adjustments to increase government revenue. At 1994 ratios the closing of a R19 000 million revenue gap would have had to depend on a R1 700 million contribution by the Black population and R17 300 million by non-Blacks, and would have constituted a 45 per cent increase on the amounts actually paid in 1994. As it is, direct taxes enacted a 77,5 per cent increase in payments between 1994 and 1998, at current prices, or 31,5 per cent at 1994 prices (GDP deflator, SARB, 1998). The comparable figures for indirect taxation were 49,2 per cent and 10,5 per cent respectively. The system of taxation had become substantially more progressive, which meant that the redistributive effect of expenditure was reinforced by the mode of financing it. But this did not prevent the 1998 dissaving from attaining a level of R19 960 million in 1998, after turning down from R24 271 million at the end of the third quarter (SARB, March 1999, p. S-129).

A by-product of the degree of fiscal discipline embodied in the course of action after 1994 discussed above has been a considerable amount of dislocation and unsettlement, and disarray in many institutions financed or subsidised by government whose personnel had to adapt to the reprioritising under trying conditions.

The economic effects identified have been the outcome of policy changes superimposed upon demographic variables. Disentangling the role of the latter quantitatively would be a topic

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[4] The 1999 national accounts revision raised the average annual levels of dissaving for the 1992-94 and 1995-98 periods to R28 060 million and R28 870 million respectively (SARB, June 1999, p. S-130). The amount of interest in question would have to be raised concomitantly to R3 190 million.

worthy of research. An illustrative proxy may act as a pointer to the problématique. To this end the question is posed: how much redistribution is actually emanating from "improvident" reproductive behaviour, by defining "provident" behaviour as that which would have produced the course of fertility of the Coloured population since 1970, with "excess" births, in consequence, equalling the numbers over and above those that would have resulted from such "socially responsible" behaviour. An intimation of the answer, in part, would read as follows. In respect of primary and secondary education 25 per cent of expenditure on Black pupils would have been averted in 1991, which percentage rises to 37 per cent by the year 2001. At constant 1995 expenditure per pupil the excess of 2 788 000 pupils in 1996, rising to 3 535 000 by 2001, would demand a contribution by income tax payers of R35 153 million during the period 1996-2001, detracting from the economic resources available for increasing the quality of human material. By contrast, provident parenthood would have reduced either a reduction in government expenditure on schooling or an increase in quality of education; and primary health care for infants younger than 6 years would have cost 36 per cent less in 1991, which saving would have risen to 45 per cent by 2001.

Viewed thus, a considerable portion of redistribution, involving as it does a shift of the burden issuing from reproductive behaviour from parent to government (tax payers), emerges as an avertible dissipation of economic resources.

12.9 SOME FURTHER ECONOMIC EFFECTS OF POLITICAL POWER

The president of the New South Africa has stated that his party "virtually came out of the bush to lead the country". The logical sequence of such acknowledgement, one would have thought, would have been gradualism in political appointments and substantial reliance on the members of the existing professional public service which is regarded as the stabilising influence in democracies with political powershifting from one party to the next, and which embodies decades of experience and expertise. This did not eventuate. Persons in positions of authority were expeditiously replaced with Blacks and other ANC/COSATU/SACP supporters. This facet of transformation was carried out in the name of affirmative action (AA), a concept whose implementation has had a history of controversy in the United States. The concept has been entrenched in the constitution and reaffirmed in subsequent White Papers and legal documents relating to economic matters.

The official publication of the Constitutional Assembly (1995) asseverated that while the new constitution would protect people from discrimination on grounds of colour, gender, religion, age, language, sexual orientation, etc. "the draft Bill of Rights also allows the state to make laws and to take other measures that will protect and advance those who were unfairly disadvantaged in the past. This is commonly called affirmative action" (p 3). The disadvantaged were subsequently designated as Blacks – the government's generic term for African/Blacks, Coloureds and Indians – women and people with disabilities. According to the White Paper on Affirmative Action in the Public Service these three designated groups had to be targeted in AA employment to render the public service representative of "the make up of the population within all occupational classes and at all post levels of the public service" (RSA, 1998, April 23, p. 51). The over-arching precondition for employment is thus founded in demographic conditions, and is tantamount to allowing persons to benefit from their community's high levels of fertility (as a cause of large population numbers). Membership of such communities becomes an employment-meriting attribute.

The principle of equal employment opportunity is endorsed, that is, "the formal right to be treated equally in employment irrespective of race, gender and disability". But apparently this does not inhibit the practising of "fair" discrimination, since "unfair discrimination refers to measures, attitudes and behaviour that obstruct the enjoyment of equal rights and opportunities in employment for Black people, women and people with disabilities" (p 51). And the Employment Equity Bill section 6(1) states: "It is not unfair discrimination to take affirmative action measures consistent with the purpose of this Act" (RSA, 1998, B 60B-98). By inference, measures, attitudes and behaviours which discriminate against the non-designated groups, and particularly Whites who were, or were considered to have been, the beneficiaries of apartheid, would be fair or legitimate or non-discriminatory, and "equal opportunity" in their case is only a formal right which is not relevant for operational purposes. This permits the government to champion a legal fiction which reconciles equal opportunity and AA in advertisements inviting applications for the filling of vacancies in the civil service, accompanied, on occasion, by a note that members of the non-designated group(s) would be considered as a last resort.

But since pigmentation, gender and physical disability could not, on their own, qualify as norms for determining the suitability of a candidate for a job, some further criteria, or yardstick, had to be devised. In the traditional Western view, suitability, for employment in jobs in which dexterity in manual manipulations is not the primary skill or qualification required, would be

measured – talent already exhibited apart – by the extent to which a candidate had been educated (not trained) for it in the broad sense of having acquired appropriate academic qualifications, experience and expertise and attained acceptable levels of professional efficiency. The 1995 White Paper on the Transformation of the Public Service paved the way for a movement away from this kind of norm by recommending "the introduction of new recruitment and promotion procedures based on non-discriminatory criteria of competency and performance rather than on formal qualifications and experience" (Chapter 10.7). And the S A Institute of Race Relations reported that "the ANC has said it wishes 'to get rid of merit as overriding principle in the appointment of public servants'" (1997, p. 22).

In pursuit of a norm that would pass muster for the purposes of AA the following stages have been passed through. A minister who was asked, by members of the personnel of a department of which he was in charge, how important he regarded standards in the appointment to 11 000 newly created AA jobs in the public service, he responded as follows: "Well, I think standards are important. Competency is important, but competency doesn't mean you have to have a set of degrees behind your name. Because I don't have that, but I've talked to presidents, I've talked to prime ministers, I've talked to kings and queens, I've talked to professors, and I feel confident to be able to handle any subject I talk to them about. I have matric. So I mean when we talk of competence it's very different from the standards ... When you put people into positions of authority, we must be prepared to come in with the type of training they may lack ... So it is useless saying we are going to put someone into a job and then we don't provide any backup of support and that person fails and therefore we say that person is incompetent". (Central Statistical Service, June 1994(a), p.8). But a sub-committee of the Constitutional Committee considered that "competency" would be too severe a requirement as it would "exclude people without specific qualifications and experience" (August, 1995, p. 2). So "ability" was substituted for "competency". But this was apparently regarded as still too demanding as a norm. In the Employment Equity Bill it was proclaimed that "a person may be suitably qualified for a job as a result of anyone of, or any combination of, that person's (a) formal qualifications (b) prior learning (c) relevant experience, or (d) capacity to acquire, within a reasonable time, the ability to do the job" (RSA, 1998, Section 20). And the White Paper or Affirmative Action in the Public Service came up with a, seemingly final, definition of suitability when it prescribed that "selection panels are appropriately trained in selection and interviewing techniques especially for identifying potential" (1998, par 3.33). The SA Airways soon underscored this *modus operandi* by making public that it was applying the criterion of potential for admission of trainees, which

did not mean proven potential as revealed by some preceding success in education or occupational performance. The president of the Black Management Forum thought that this represented an improvement on the performance of the previous government: "In the past a chief factor for employment was race. However, in this bill [Employment Equity Bill] potential is an added requirement over and above being Black" (Ndlovu, 1998, p. 1). Perhaps most revealing of the esteem in which the principle of excellence is held, is the Minister of Sport's Commission which is empowered by law to enforce demographic "representativity" in all sports' teams, lack of superior performance notwithstanding (Perreira, 1999, p. 10).

The metamorphoses of the norm from standards to competence, to ability and to potential, in concurrence with political patronage, permitted the creation of instant directors-general, deputy DGs and other heads of departments, executives of parastatals, instant generals, instant diplomats, etc. Inability to handle a job for which a designated person was appointed could be accommodated by means of a period of apprenticeship during which he/she would enjoy the full financial benefits of the appointment, or through the services of consultants. (By the end of 1997 the government had already paid out R898 million in consultants' fees (Sawyer, 1997, p. 8)).

The AA targets to be achieved were formulated as follows in the 1995 White Paper on the Transformation of the Public Service: "Within four years all departmental establishments must endeavour to be at least 50 per cent black at management level. During the same period at least 30 per cent of new recruits to the middle and senior management echelons should be women. Within ten years, people with disabilities should comprise 2 per cent of public service personnel" (Chapter 10.6). Officials responsible for implementation who did not achieve set quotas would be subject to punitive measures. The 1998 White paper on AA was emphatic that "the Public Service cannot and will not entertain an apologist stance to affirmative action nor should any individual from the historically disadvantaged feel apologetic about benefiting directly from this programme" (RSA, 1998, par. 1.18). And Mandela, in his 1998 State of the Nation address to parliament, proclaimed that "we shall not be discouraged by the sirens of self-interest that are being sounded in defence of privilege, and the insults that equate women, Africans, Indians, Coloureds and the disabled with a lowering of standards" (Government Communications, 1998, p. 4). (There is some misinterpretation here. Critics – at least those who air their views in public – are not defending privilege but the rule of meritocracy, and it is not the groups mentioned that are equated with a lowering of standards, but the individuals appointed on the strength of pigmentation and potential rather than on proven merit in the eurocentric tradition. And since

individuals, and not groups, are appointed, the moot question is: are those who are benefiting from AA really the ones who have been disadvantaged by previous governments? And to what extent is AA a euphemism for political patronage, the professed goal of which is the establishment of dominion over a maximum, if not all, spheres of public life, for which purpose a deployment committee, under the direction of the deputy president of the ANC, has been established?)

The ANC has been going enthusiastically about its business of transforming the civil service. It is not possible to present an unequivocal picture of the overall course of employment by ethnic group in the public service since it is impossible to know what to make of the category "unspecified", in Central Statistical Service's Statistical Release P0251, after June 1997, which includes 67 per cent of the personnel of national departments and provinces. The data in the March 1998 Bulletin of Statistics, moreover, differ from those in P0251, while there is a serious discontinuity between the series published in P0251 of June 1997 and that of December 1997. The number of Whites employed in the first and second tier governments seem to have diminished by 45 800 between June 1994 and December 1997, their share in the total declining from 22,3 to 17,5 per cent. However, the important issue is not the absolute number of replacements, but their professional status in the civil service. Of the non-executive 11 000 jobs specially created for AA purposes – which required some specific know-how – only some one-third had been filled, despite a massive number of applications. The target has been, and is, the top echelons in the bureaucratic hierarchy where the maximum influence could be exerted.

To accord, presumably, with the new president's assurance that Whites did not have to fear dismissal, "vacancies" were advertised to serve as notice of superannuation to the incumbents. Their right to re-apply was meaningless, the advertisements having signalled that the government wanted them replaced by Blacks or persons of known ANC sympathies. Within four years after taking office, the ANC-in-government had appointed 28 of the 35 directors-general and departmental chiefs of similar states, while only one the nine provinces had a D.G. who served under the previous government. Of the 65 deputy D.G.'s at national level, 47 owed their appointment to the ANC (Capraro, 1998). The national director of public prosecutions and the new president of the Reserve Bank have been ANC politicians, while the appointment of the new chief justice was publicly favoured by Mandela, ahead of the decision by the Judicial Services Commission (JDC). And afterwards this judge told the JDC that before they appointed judicial

officers they should consider "whether the appointment reflected the racial and gender composition of South Africa" (Democratic Party, 1998).

ANC supporters were put in control of the most important electronic news medium, the SABC, and within two years its chief executive described it as the most transformed institution in South Africa. The Minister of Health, within one year after taking office, announced that her department's top management had been changed from a 100 per cent white male occupation to a 70 per cent black and 30 per cent female incumbency (Duvenhage, 1995). Seven Blacks who served in the armed wing of the ANC, UmKhonto weSwizwe, and one ex-member of the erstwhile independent Transkei were appointed generals in the new Defence Force, but manifestly not fulfilling the appropriate functions until they had undergone some years of training. More than 60 per cent of experienced career diplomats have been replaced with political appointees. A journalist disclosed that the Minister of Foreign Affairs had submitted the names of 30 persons to the Minister of Public Service and Administration for appointment to posts in the diplomatic service; for most of which a baccalaureate plus ten years of experience was the customary prerequisite. In the case of eight there was no mention of a previous employer or experience. For a further nine of the recommended candidates no CVs were furnished. One of them was appointed to a senior post in Norway and another became high commissioner in Pakistan (Gunning, 1997). The response of the DG of Foreign Affairs to this disclosure was the following (freely translated): "It is true that some of the new members of the department possess other qualifications and skills than those required (by the previous government) of White officials who had enjoyed the benefit of White education and post-school training. This does not mean that the new members are inferior or less capable. In a new establishment it was essential, in the interests of justice, to use new yardsticks" (Evans, 1997).

AA approaches its zenith when it enters the portals of institutions traditionally regarded as meritocracies. According to a research document of the Democratic Party, UNISA informed its personnel that promotion for Whites was out; the Vaal Triangle Technikon put on record that no more Whites were going to be appointed and Whites in strategic positions were going to be removed; the University of Cape Town let it be known that applications from Whites would be considered as a last resort only; and the Minister of Health insisted that medical schools, in their 1999 intake of first year students, attain demographic representivity, and threatened that government funding would be in proportion to the number of Black students enrolled, regardless of the composition of the academic human material available (1999).

Parallels have been drawn between the ANC's affirmative action and the pre-1994 NP government's policy of discrimination in favour of Whites, and particularly White Afrikaans speaking persons, suggesting that the former was doing no more than emulating its predecessors.

There is, of course, a similarity in that both regimes subscribed to the principle of pigmentocracy. But there have been significant differences in the implementation of the respective policies and their outcomes. The NP government observed, by and large, the rule of meritocracy. The aggrieved parties were, in the main, equi-merit, politically incorrect Whites, not Blacks who, until the newly established separate tertiary educational facilities had borne fruit, had little chance of competing successfully even in the absence of apartheid's impediments. The apartheid government did not create the relatively lesser developed status, or arrearage, of the Black population, but inherited the situation, and attempted to attenuate it, discrimination not withstanding.

As a rule the NP government's executives took office after having been educated for it (as defined above), having risen through the ranks in an experience-accumulating process, and complying with the bilingualism requisite. This is in contrast with the belief or assumption that a short period of training will invest persons with the necessary qualities, an assumption that wreaks maximum economic damage when the AA's target group is at the executive level.

The ANC's affirmative action has been a programme of employment substitution, entailing a loss of jobs of another section of the labour force. The AA of the NP – if it could be depicted thus – was employment constructive, not only for Whites, but for all population groups, and Blacks in particular. The number of the latter employed by the first and second tiers of government increased from 162 200 in 1960 to 778 100 in June 1994, or at a rate of 4,8 per cent per annum compared to 3,1 per cent per annum in the case of Whites (Bureau of Statistics, 1964, p. H-38; CSS, 1997, P0251, p. 7). This was, moreover, accompanied by a *quid pro quo* for the discrimination practised in the Common Area. By granting the former Black Homelands self-rule in the SGT's and autonomy in the TBVC countries they were freed of the encumbrances of apartheid and empowered to appoint Blacks to posts at all levels in the public service, at the expense, for the most part, of White taxpayers. (There is, by contrast, on the part of the ANC, no appetite for entertaining the Freedom Front's "volkstaat" proposal. (Afrikaner Homeland where

self-determination would prevail)). The right of association is enshrined and enforced; the right to dissociation is anathema.

The new government's intervention in favour of Black business (empowerment) could be considered as the obverse to the previous regime's policy of putting impediments in their way. The Bill relating to the National Empowerment fund for the "historically disadvantaged persons" provided for its capital expenditure and operating costs to be funded by means of parliamentary appropriations in addition to income generated by the Fund itself. Only Black South Africans or companies run by them could become shareholders who would benefit from the concessions that the Fund could acquire shares in state-owned enterprises at prices "less than the market related price of the share" (RSA, B-121 D 98; Sect. 23(b)). The Competition Bill, which prohibits restrictive practices such as price fixing, collusive tendering and abuses arising from dominant positions, allowed for exemption from these regulations in the case of Black firms (RSA, B-128-98, Sect. 10). And the Deployment Committee of the ANC sees to it that these businesses are headed by Blacks and ANC supporters who could be called upon to support government policy and initiatives when the need arises. It has been dubbed crony-capitalism (Sono, 1999, p. 21; Coetzee, 1999, p.18). Black control over formerly White-controlled businesses was facilitated and accomplished with a minimum of cash investment and a maximum of borrowing, N shares, rights issues, redeemable preference shares, instalment buying of shares and business pyramids.

The White Afrikaners' economic battle cry of the 1930s would, in end-of-century jargon, read "a nation empower itself". The post-1994 approach has the semblance of "a nation is owed empowerment". There has been no parallel between the trials and pace of self-empowerment and those of the asset-transfer empowerment.

Under the previous regime AA or discrimination was practised in favour of a minority; under the new one it is carried out in the interests of a large majority. Given the yardstick for assessing the suitability of candidates for jobs, the potential for injury to the economy is much greater under the present régime than the previous one, by reason of relative population or labour force numbers. Since the values of the majority in power prevail, and the minority groups in South Africa have little or no hope of becoming a political majority in the foreseeable future, there is no external check on the degree of injury which can be inflicted upon the economy. It is exacerbated if it is accompanied by corruption, which includes fraud, theft, nepotism, bribery and all forms of

wilful maladministration, i.e. which do not stem from sheer ignorance or incompetence (though this latter attribute does not render it any the less regrettable).

Since some corruption appears to be a universal phenomenon, it is not the simple fact of its existence that is important, but its incidence (per 1000 or 10 000 of the labour force or man years for example) or intensity of occurrence. The true extent of corruption under the previous government is not known, but it seems to have ensued from political power maintained over a number of decades. The frequency of reported incidents among the ranks of the new regime gives it the appearance of not being an exception to the rule, and it is occurring at the inception of the new government's term of office, not after decades of wielding absolute power.

The findings of the auditor-general, the Heath Commission, some other Commissions, individuals appointed to investigate alleged irregularities, researchers of political parties, and writers practising investigative journalism, or reporting from parliament, have the complexion of a litany of transgressions. The New National Party in its *Corruption Barometer 1994-1998* reported 911 cases of fraud and theft, and maladministration for personal gain which occurred since the new government had taken office, and involved an amount of more than R21 000 million, for which top officials at both first and second tier government levels were responsible (Vorster, 1998). A few examples will have to suffice. On the margin of wilful maladministration are the unauthorised expenditures by fourteen national departments amounting to R1 014 million during the fiscal year 1996/7, as disclosed by the Auditor-General (1998; Phahlane, 1998). In one province six members of the executive council had to vacate their posts because of misdemeanours such as illegally signing away game parks as collateral for overseas loans worth R1 300 million; spending a R20 million "slush fund" on 300 supporters illegally employed by one MEC; issuing a fraudulent driver's licence to the National Parliament's deputy-speaker; having been found guilty of wife-battery; handing out 10 new luxury cars as Christmas presents for his fellow Cabinet ministers; breaking most of the regulations in the housing procedure book; the speaker of the provincial government allowing his deputy to embezzle more than a million Rand; the deputy-speaker caught filling shopping trolleys on state account; the chief executive officer of the Development Corporation faking vehicle claims; a consultant having himself hired at a rate of R15 000 a day after which he had to repay R700 000 to the province, etc. (Arenstein, 1998, p. 4). In another province the Auditor-General found that in four years' time, since 1994, some R700 million had been lost as a result of unlawful promotions and of salaries paid to between 26 000 and 30 000 ghost officials (1998); other officials stole R5 million from the

province's department of nature conservation; another official filled the tank of an official car every eight minutes (Vorster, 1998, p. 114). In a third province 69 officials unlawfully stayed in hotels at a cost of R2 million to the legislature. The South African Revenue Service discovered that some members of its personnel were cashing cheques from taxpayers for their own use. Five councillors of the Independent Broadcasting Authority had to resign after using official credit cards to pay for personal purchases (Swart, 1998). Six AA managing directors of a parastatal were dismissed for abusing, from the start of their career, their positions for personal gain (Van der Kooy, 1996, p. 184). A one-time partner of the Minister of Justice who had been disbarred for the misappropriation of trust funds, was appointed as consul-general in India (Braid, 1999, p. 3). (A public outcry caused him to turn down the offer). Some ANC representatives in public organisations remained in office and received their regular salaries/allowances while charged with, or found guilty of, misdemeanours such as drunken driving on the wrong side of a national road and attempted murder (Coetzee, 1998, p. 12).

Mandela, as guest speaker on the opening of the provincial synod of the Moravian Church, inveighed against the "freedom fighters who had become corrupt after becoming members of the government ... stealing money intended for our children ..." (Sadovsky, 1998). The deputy-president promised in 1997 that the Cabinet was going to launch an attack on corruption.

But in parliament a Cabinet minister attempted to cast a slur on the integrity of the Auditor-General. And, when the chairman of the Heath Commission, who described the theft of public funds as a national crisis, complained that his investigations were being hampered by the tardiness of provincial premiers to issue the required proclamations (to authorise investigations) (Braid, 1998; Finance Week, 1999) the Minister of Justice accused him of acting like a politician, while the Minister of Finance called him a Don Quixote (Gunning, 1999). In this instance, however, the windmills are real impediments on the route to efficient governance and economic growth.

The moot question is: are the above events representative of "accidental" corruption, the result of sheer cupidity on the part of some individuals, and of being unaccustomed to handling large sums of money which do not belong to them; or is it "entrenched" (systematic, pervasive) corruption (Institute of Futures Research, 1998, p. 3) which has become part of a tradition or culture? The frequency of transgressions supports the latter point of view. If "it is perfectly correct to assert that all of this was spawned by apartheid" as Mandela would have it in his

valedictory address to parliament on the fifth of February 1999 (Christianson, 1999, p. 9), then it can be termed pervasive, if not entrenched – though the link may be difficult to discover. There is, in this regard, an episode which may be of more than incidental significance. A president of one of the former TBVC countries, when charged in court with misappropriating mining royalties for his own use, pleaded that in the nature of his tribe's tradition this could not constitute theft. After he was found guilty his tribe affirmed that it was not possible for a chief to be guilty of the crime of theft when he used tribal funds for personal purposes. The leader of the tribe had a right to it (Moletsane, 1998). A former principal of a traditionally Black university maintained that much of what was being seen as corruption in the Western view, is not regarded as such by the Black community, as long as the action was decided upon by the leader. His power is paramount (Boshoff, 1997). Could officials in authority consider themselves proxies of chiefs and headmen? Do the "fostering conditions that lie behind high levels of governmental corruption in African capitalist societies" have relevance for South Africa: "Unlike the early phase of Western capitalism, which emerged within a strong cultural framework that imposed disciplined restraint, the early phase of African capitalist development exists within a weak cultural framework ... the capitalist consumption ideology assumed dominance before their industrialisation" leading to "motivational pressures toward economic deviance ..." (Washington, 1988, p. 215). To the extent that corruption is pervasive, whether or not it has some cultural roots, it is the more difficult to eradicate, the cost of exposure is the higher, and damage to the economy is the greater.

To quantify the direct cost of corruption which would require a distinction between the roles of corruption and incompetence in the level of the amounts published in journals or reported in parliament, is problematical. Apart from the sums mentioned in the NNP's *Corruption Barometer* (Vorster, 1998), the chairman of the Heath Commission of enquiry into corruption in South Africa reported that he had 834 cases involving some R10 000 million, on his register and that his Commission had already averted a loss of R848 million the state would otherwise have forfeited (Waldner, 1998; Dommisse, 1999). Part of it was the result of recovering some of the R1 469 million over-payments to civil servants unlawfully promoted by a former TBVC government (RSA, 1997, p. 7). There have been instances of foreign aid to welfare projects being suspended or withdrawn as a result of corrupt practices, as, for example, in the Sarafina scandal, the National Literacy Cooperation project and the Foundation for Peace and Justice (Swart, 1998).

In these quantified manifestations of corruption the increased cost to the taxpayer of governance is apparent, encompassing both the diversion of resources away from their intended effective application and the cost of tracking down the culprits. Given the fiscal policy, poor recipients of government grants and allowances are deprived of some economic welfare. It amounts to unlawful redistribution in favour of the higher income classes.

But probably of greater consequence than these overt costs is the insidious indirect effect on the economy at large. The guilty public-servants, devising ways of siphoning public funds into their own pockets, are not devoting all their time and energy to their professional duties, this reducing the efficiency of the public service. Their actions form part of the environment in which business is conducted and decisions on investment or expansion are taken. A corrupt public service constitutes an entrepreneurship-inhospitable environment, diminishing the incentive to invest and retarding economic growth. An IMF official found in a regression analysis that if the corruption index [0 for most, 10 for least corrupt] "improves by one standard deviation ... the investment rate increases by more than 4 percentage points and the annual growth rate of per capita GDP increases by over half a percentage point" (Mauro, 1997, p. 9), while "government spending on education as a ratio to GDP is negatively and significantly correlated with corruption" (p 10). An empirical analysis by two of his colleagues showed up that, among others, "high corruption is associated with low operation and maintenance expenditures ... and poor quality of infrastructure" (Tanzi & Davoodi, 1998, pp 8-9). This finding is consistent with the South African data in Table 12.1. The supporting base of future growth is being eroded.

Domestic entrepreneurs may learn to live with the aberration, since they may have little choice, but foreign investors, who base their decisions on calculated relative country risk, increasingly perceive corruption as integral part of that risk, a high level of which militates against positive action. Two researchers, whose empirical analysis did not establish "either a correlation or a univariate relationship between perceived corruption and investment flows into sub-Saharan Africa" nevertheless concluded that "SSA will continue to have major problems in attracting investment until ways are found to counter the negative perception of rife corruption which private sector investors have of the region" (Okeahalam & Bah, 1998, p. 378). And another author contended that "the economic crimes of African governmental officials are one of the major causes behind Africa's development crisis" (Washington, 1988, p. 201).

The economic cost of corruption is attenuated in a fast-growing economy with a well-educated capable labour force. The qualifying condition is not satisfied in South Africa. Corruption here is superimposed upon a transformed bureaucracy headed by AA appointees whose "potential" is still to be converted into acceptable standards. The combination is economically noxious and the malady is exacerbated by the protection of incompetence which, according to a political philosopher, is in itself one of the more dangerous forms of corruption (Esterhuyse, 1999). Such protection is manifested in the "redeployment" of public officials who have proved to be failures as professionals.

In successive reports the Auditor-General has repeatedly drawn attention to the unsatisfactory conditions prevailing in the public service. In 1997 he complained that "many shortcomings in management measures and examples of the effects thereof, involving millions of Rand where the taxpayer did not receive value for his money, have already been reported to Parliament and other legislative bodies in audit reports tabled by this Office" (RSA, 1997, p. 15). "Many of the problems are caused by a shortage of staff with the necessary experience and skills, and the proper training for newly appointed staff" (p 8). Among others, unnecessary borrowing had added R423 million to the interest bill. A fifteen member audit team led by the DG of the Department of Public Service and Administration found that "most provinces had no qualified financial managers, and unqualified finance personnel were administering budgets of billions in the absence of proper financial management training and skills ... The implementation of the voluntary severance package was criticised for resulting in a lack of skills and expertise" (Shindler, 1998, p. 5). In three provinces the MEC's responsible for the portfolios of Education had been removed from office for, respectively, "administrative-incompetence", "inefficiency" and "in the interest of good governance" (p 5). During the 1997/98 fiscal year "civil servants in Gauteng crashed more than six government vehicles every day" (Reeves, 1998).

A well-known member of the ANC, who resigned from her position as member of the Human Rights Commission and of the Commission for Restitution of Land Rights described her experience in these Commissions as "virtually a nightmare". Doing one's best, she attested, in the company of persons not properly skilled was considered reactionary. Frustrated Commissioners were reluctant to expose the incompetence of some Black members – who considered themselves entitled to their jobs because of their "struggle" career – since it would have been considered racist (Kadalie, 1999). A harsh verdict emanated from a foreign source. An American monthly, *National Review*, testified to the perception of some foreigners about

conditions in South Africa: the "foolish" application of AA is blamed for incompetent persons landing up in positions of authority at the expense of experienced professionals, with the result that public administration is falling apart; "everything bears the stamp of decay" (Reported in Holzapfel, 1998, p. 28). Into this picture fits the grievance of businessmen and independent professionals that government bodies are loath to settle their debts in due time, and that much time and energy are wasted in attempts to wrest from officials the amounts owing.

The adversity of the milieu, described above, in which the economy has to operate, is aggravated by a side-effect of AA which is "to fan the flames of racial hostility even more", according to sociologist Schlemmer (Beaver, 1997, p. 25). It is not a recipe for the co-operation of diverse population elements, or "building a nation" with a common purpose. The victims, who believed that they owed their positions to merit and not to apartheid considered themselves unfairly discriminated against, and the population group of which they are members has no incentive to promote the success of government initiatives.

An exercise was carried out to quantify the implications of appointing persons (in this case males, since they predominate in the higher skill categories; but inclusion of females will not vitiate the conclusions), in accordance with the ethnic composition of the population. Teachers have been excluded since their supply, quantitatively though not qualitatively, is adequate to satisfy demand. The labour force was divided into two groups, Blacks and non-Blacks, and their numbers by skill projected from 1995 to 2005 on condition that the trends of the 1965 to 1995 period – in which Blacks made rapid progress on the skill ladder – were to continue (Sadie, 1995, April 18, p. 32). Assuming that the composition of the Black and non-Black aggregate would prevail in the year 2005, it was possible to deduce the numbers of non-Black workers who were to be replaced with Blacks to reach the target of the "correct" ethnic composition of the labour force by that year. These could be compared with the increases by skill of the Black labour force (LF) during 1995-2005 which could reasonably be expected (projected) in the absence of discriminatory AA. Table 12.15 has the details.

TABLE 12.15

MALE LF BY SKILL AND REQUIREMENTS OF AA

	1995 LF		Non-Blacks to be replaced by Blacks 1995-2005	Expected increase in Black LF 1995-2005
	Non-Black	Black		
Managerial class	294 000	17 000	229 000	12 000
White collar professionals	301 000	74 000	234 000	54 000
Blue collar skilled	488 000	256 000	309 000	94 000
Semi-skilled	1 117 000	2 776 000	-	882 000
Unskilled	375 000	4 308 000	-	630 000
	2 575 000	7 431 000	772 000	

A comparison of the last two columns of Table 12.15 reveals that the target hypothesised in the calculations (which is less demanding than that of AA) can hardly be called feasible in the normal course of events, which means it is not compatible with the maintenance of standards. Enforcing the AA policy targets in respect of the higher level manpower requires recourse to second-best or still less appropriate human material for the purposes in mind. As a matter of elementary probability, a choice of one candidate out of a total supply of 1 is most likely to produce less proficiency than one out of 17 or one out of 7. Already in 1995 the Auditor-General and the DG of Finance, in evidence before a Parliamentary Select Committee, warned that the civil service was on the point of collapse because of the AA administered by the Public Service Commission who had no notion of the Service's priorities (Cameron, 1995). There is a net loss of experience, know-how and efficiency as the old guard is being ousted, some vacancies remain unfilled because candidates from the designated groups, satisfying the least exacting AA criteria, are not available, or because of inefficiency on the part of bureaucracy or political authorities responsible for appointments.

In the stagnant, or even labour-shedding, labour market of South Africa AA means displacement only. A few victims have taken legal action against the authorities responsible for the discrimination to which they were subjected. One example merits special mention because of the tenor of the judge's verdict. Fifteen lawyers who had been identified for priority advancement because of their work, but were ignored when thirty advertised state attorney posts had to be filled, took the Minister of Justice to court. In his ruling the judge stated that "the facts fully justify the conclusion that the white male applicants for the state attorney posts have been discriminated against on those very bases – that they are white and male ... I do not read the promotion of representivity as warranting the sacrifice of an efficient administration ..."

(Institute of Futures Research, 1997, p. 2). There is no indication that this censure had any effect on government policy.

The Indians of Kwazulu-Natal took private action and established a College of Medical Sciences in Pietermaritzburg when their A-students were denied admission to universities because of AA (Bot, 1998, p. 15).

12.10 CONCLUSION

In a democratic election a straightforward count of party supporting numbers is the determinant of the outcome which, in the ethnically diverse population of South Africa, permits of high fertility coming to the aid of political parties. Given the cohesive factors (e.g. common experiences, history, culture) conducing to intra-group solidarity, the victory, at the polls in 1994, of the numerically preponderant, high fertility Black population group was a foregone conclusion. The economically least developed section of the population, who had also suffered under the iniquities of the previous regime, came into power. With apartheid providing a ready-made and all-embracing recipe in aetiology – in which every conceivable phenomenon of a non-benign nature could be attributed to apartheid – the new government set about exercising its ruling passion for transformation, which meant change in the features and nature of every aspect of public life. It was inspired by the need to deliver on its election promises to alleviate poverty and economic arrearage, to accommodate elements of diverse political persuasions in the ranks of the ANC/COSATU/SACP alliance and to extend its dominion over all seats of power.

Political power entails economic power and a potential for vital impingements upon the economy. The (intensified) income redistribution through the national budget represents, in part, support to the results of high fertility. The focus on welfare services reduced the resources available for supporting or generating growth, which spelled an ascendancy of wealth distribution over wealth creation. The AA programme elevated relative numbers ("representivity") to a yardstick of merit for the purpose of employment in the public administration, subsequently extended to the private sector. The new education policy has the appearance of an attempt to create masses of literates rather than substantial numbers of achievers. The AA-induced incompetence and inefficiency in the public service and the harm thus inflicted upon the economy, compounded by corruption and exacerbated by a high incidence of crime, fashioned the environment in which business had to operate. The verdict of the IMF in

this regard is unequivocal. "Not only do weak governances and corruption tend to lower government tax revenue and thereby both contribute to fiscal imbalance and reduce critical public investment in areas such as health and education, but they also deter domestic and foreign direct investment" (1997, p. 88). The casualty is economic growth.

In the wake of the elation engendered by the peaceful political transition – which testified to the concern of the former power wielders about the damage to the economy and to their living standards of a continuance of hostilities – the economy thrived for three years at an average GDP growth rate of 3,2 per cent per annum (SARB, March 1999, p. 5-109). By 1997 the economy seemed to have run out of steam, the last two quarters of 1998 having seen absolute reductions in GDP (at constant prices). At the beginning of 1999 the Bureau for Economic Research's business confidence index stood at a historical low (BER, 1999). At the time it appeared that the new government had not yet generated a climate of optimism which imbued entrepreneurs with an enduring enthusiasm for new growth-creating initiatives.

And so the enhancement of economic welfare of the poor and the disadvantaged has been counterbalanced by an economy-debilitating socio-political environment, and did not reduce the inequality of income within the Black community itself, but increased it. Again, such welfare-enhancing action did not originate in 1994. By that year economic history had already registered a multiplicity of compensatory actions, i.e. examples of restitution (Sadie, 1993, p. 13; 1995, pp 29, 32, 37, 44) by previous governments. Most importantly, the new establishment was left a legacy of a reasonably well-developed economy and, accordingly, a lucrative source of government revenue, which – in African terms – was a donation of major proportions. While it might be argued that the market value of suffering arising from, e.g. violations of human dignity, is infinitely expansible, and therefore justifies a form of retaliation, measures of an economically less prejudicial nature than some of those adopted in the transformation process could have been devised.

Any South African government attempting to create a welfare state will be confronted with a basic demographic fact: it is a small enterprising minority who will have to provide the economic means for it, and succour the large majority. A policy, simulating that of a highly developed society, founded on a presumption that a sufficient condition is that Whites share their fortune, is fundamentally flawed.

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CHAPTER 13

INVESTMENT AND SAVING

Since investment is the process through which capital is formed the contents of Chapter 9 are relevant here. To focus on domestic saving and investment it is assumed that the current account of the international balance of payments is in balance and that there are no transactions on capital account. (The latter condition is more restrictive than a zero balance in which the inflow may be accompanied by entrepreneurship while its outflow is not).

Accordingly I = Y-C = S, with I and S both performing as cause as well as effect. In a non-static economy, with its leads and lags, the two magnitudes can differ before the economic process has provided the equilibrating force. One can also conceive of a long run tendency towards a surfeit of S vis-à-vis I, or investment opportunities (the deflationary gap) and a chronic dearth of S (the inflationary gap). The former situation could occur in highly developed mature economies, while the latter is likely to obtain in low income LDCs. In both situations economic growth is restrained, which would be manifested, mainly in unemployment in the MDCs and poverty in the LDCs.

Table 13.1 furnishes us with data on the contributions of the three sources of domestic savings in South Africa during the most recent years.

TABLE 13.1

DOMESTIC SAVINGS AT CURRENT PRICES (R-MILLIONS)

	1991	1992	1993	1994	1995	1996	1997	1998
Personal S	3 613	9 392	13 078	11 114	5 687	6 961	3 267	2 118
Corporate S	13 001	17 079	22 369	23 984	27 902	30 295	29 575	23 922
Government S	-4 799	-18 555	-23 652	-20 537	-17 594	-17 746	-22 050	-19 960
Net S	11 815	7 916	11 795	14 561	15 995	19 510	10 792	6 080
Depreciation allowances	46 720	50 272	54 108	59 338	65 936	72 151	79 348	85 617
Gross S	58 535	58 188	65 903	73 899	81 931	91 661	90 140	91 697

Source: SARB *Quarterly Bulletin*, March 1999. S-125.

The outstanding features of the statistics in Table 13.1 are the volatility and low level of personal savings and the very large amounts of government dissaving (as mentioned in Chapter 12). Total net savings peaked at R19 510 million in 1996 (or 3,6 per cent of GDP) and diminished precipitately to R6 080 million in 1998, which was equal to 0,9 per cent of GDP, and had the semblance of insignificance when measured against an ICOR of 3,3 and a population growth rate of around 1,8 per cent per annum. Even at its 1996 peak, domestic saving comprised (*ceteris paribus*) only two-thirds of the amount needed for the maintenance of production per capita. Potential relief which could emanate from a decline in the ICOR is being thwarted by organised labour.

Until 1977 personal S used to be the major contributor to the aggregate, but has since become a poor second to corporates, the latter exceeding it in a 2,6 to 1 ratio during 1989-1995 and in an 11,3 to 1 ratio in 1998. Up to 1980 personal S, at an unweighted average percentage of 9,1 during the twenty year period 1960-1980, constituted a sizeable portion of disposable income. The average shrank to 3,3 per cent over the following fifteen years, signalling a precipitate, unheralded structural change and slumped to a historic low of 0,5 per cent in 1998.

The amount or intensity of personal, or private household, saving is a function of (i) the sum total of a variety of individual dispositions to save (thrift), (ii) the ability to save, and (iii) possible incentives occasioned by family obligations. The second and third factors are demographically related while the influence of the cultural component, internationally or between groups in the same country, is not to be depreciated. In the United Sates it was, for example, found that children approaching the age of entry into tertiary institutions tended to have a positive effect on savings as parents probably anticipated the costs involved (Espenshade, 1975: p. 125). However, statistical evidence does not seem to permit of better than tentative conclusions about saving behaviour, particularly among high income societies.

Demonstrating the effect of family size on the ability to save is a fairly simple exercise. We hypothesise a family consisting initially of husband and wife and expanding to six by the addition of four children, the breadwinner earning a HSL monthly income of R883 appropriate to a six member family, as already presented in Table 11.1 of Chapter 11 (Potgieter, 1994, p 56).

TABLE 13.2

ABILITY TO SAVE ACCORDING TO FAMILY SIZE

	HSL Income required for basic needs	Discretionary Income HSL-Exp.	Saving at a 10% quotient
Husband & wife	R507	R376	R37,60
+ Child 1-3 yrs	572	311	31,10
+ Child 4-6 yrs	657	226	22,60
+ Child 7-10 yrs	759	124	12,40
+ Child 11-14 yrs	883	0	0

It is assumed that saving is only possible when there is some "discretionary" income, that is, an excess of income over the minimum amount required to satisfy basic needs. Inevitably, with every new arrival on the family scene the ability to save is being diminished until, with the sixth addition, it is reduced to zero, the total HSL income being absorbed by consumption.

Where it is the tradition to regard children as members of the family labour force at a very early age who do not simply substitute for some of the input of effort by the breadwinner, as in subsistence agriculture for example, additions to the family may raise the income available. But this does not necessarily make for an increase in savings, since from the kind of low levels of income represented by the HSL, any increase is most likely to be used for raising living levels by means of greater consumption. Indeed, when there is an adequate supply of natural resources, such as land, as the unique co-operant factor of production, increasing returns may apply with additions to the family size, but in the real world this stage has long been passed, with diminishing returns constituting the rule. Family income totals may increase but *per capita* incomes decline, as has been found in a number of surveys in Africa, which also indicated that extended families earned more but saved less than nuclear families, probably as a result of the former offering more security to their members (De Lancey, 1990: pp. 117-118).

Apart from representing additions to the family's labour force, children also serve as the embodiment of savings in traditional, usually rural, societies with close family ties in which high fertility is considered culturally laudable in any case. Male offspring are expected to provide for their parents in their old age when these latter are not physically able to continue doing so themselves. Daughters also represent assets in that parents have the prospect of receiving lobolo, or "bride price", when they marry. It is, however, an inefficient form of saving. To be sure of

having a son alive by the time of his retirement (age 60-65) a father would need to have his wife give birth to at least four children and, of course, to nurture the survivors among them. For certain rural areas of Black Africa one estimate has put the number of children required for ensuring two live sons, at 8 (United Nations, 1989: p. 66). The availability of economic resources for the formation of human capital is prejudiced. Moreover, the pressure of proliferating families on land eventually leads to its degradation and, accordingly, the consumption of the "natural capital" used for eking out a living.

We can also illustrate the differential ability to save of two communities, one a young, high fertility Black (B) community, the other a White (W) low fertility, ageing one, by using yearly earnings (E) data commensurate with the consumption levels in Table 11.2. Before being discounted for the probability of employment in a stationary labour market a 100 per cent employment level is assumed.

TABLE 13.3

PER CAPITA EARNINGS FOR TWO POPULATIONS (B & W) WITH DIFFERENT AGE STRUCTURES BUT WITH SIMILAR EARNINGS PER AGE INTERVAL

Age	E	B(x)	ExB(x)	W(x)	ExW(x)
15-19	R 6 800	,107	R 728	,086	R 585
20-24	7 100	,092	653	,086	611
25-29	7 500	,091	683	,082	615
30-34	7 850	,070	550	,080	628
35-39	8 300	,057	473	,075	623
40-44	8 700	,045	392	,073	635
45-49	9 100	,036	328	,065	592
50-54	9 600	,030	288	,055	528
55-59	10 100	,024	242	,044	444
60-64	10 600	,018	191	,038	403
65-69	5 300	,012	64	,032	170
Per capita of total population			4 592		5 834
Discounted for probability of employment in a stationary job market		(,27)	1 240	(,70)	4 084

This discount applied is the inverse of the manpower coefficient of replacement, which is a purely demographic magnitude. Matching those earnings data with the consumption (C) figures in Table 11.2 we have the following outcome:

	E	C	E-C
Black	R1 240	R1 704	-R 464
White	R4 084	R1 846	R2 238
W-B	R2 844	R 142	R2 702

If we posit that everybody consumes only the HSL minimum and that each W individual transfers R464 to each B individual to compensate for the latter's earnings deficit (by way of the national budget, for instance) he has R1 774 available annually to add to savings. The investment of these annual amounts over a period of 28 years (the length of life of a generation) at a 7,5 per cent rate of return (the returns to South Africa's fixed capital stock over the period 1982-1994), engenders a productive asset worth R164 380 which could, at a 7,5 per cent return, yield an annual dividend of R12 330 *per capita*. It is, of course, hardly likely that in practice, the "discretionary income" (E-C less transfer) would be saved *in toto*; the major portion would probably be used to raise consumption levels. Even so, Table 13.3, considered together with Table 11.2, which demonstrates, at least, the potential for saving, serves as a confirmation of the obstacles in the way of economic growth and development posed by high fertility and the resultant economically adverse age composition.

However, when the ageing process is reaching an advanced stage, savings may also be adversely affected. In a research project of the World Bank, into the causes of variations in savings rates across countries, it was found that "an increase in the young age dependency ratio of 3,5 percentage points leads to about 1 percentage point decline in private saving; an increase in the old age dependency-ratio has a negative savings effect more than twice as large" (World Bank, 1999, p. 4).

On the basis of the sources of data quoted with Table 11.5 (Chapter 11) the savings ratios of the four population groups, expressed as percentages of 1994 disposable personal income (DPI), amounted to 6,6, 5,1, 3,4 and 1,7 per cent for Whites, Asians and Coloureds and Blacks respectively, producing an average of 4,4 per cent. Projecting the DPI to 2004 on a constant per capita basis, produces a marginal savings ratio of 2,8 per cent, the result of the lowest per capita DPI, lowest savings ratio group increasing fastest in number. There is a possibility that the increasing inequality of income among Blacks may raise their savings propensity somewhat but not to the extent of preventing declining aggregate ratios. By the turn of the century the White population will have reached the stage where the demographically determined ability to save will

start to wane. The relative size of the economically active age category, 15-64, will diminish, while the net consumer age group 65+ will be expanding faster than the net consumer under 15 portion will shrink in size. Future levels of saving and investment are in jeopardy.

Recently, government has been adding to their jeopardy. As explained in Chapter 12 it has been actively reducing saving directly by approximately R20 000 million per annum[1] during the seven years 1992 to 1998 and is expected to continue in this manner, as the socio-economic services to the fastest growing group are being expanded, whose per capita contribution to the funding of those services is lowest. During the seven years in question government reduced the savings (net of depreciation allowances) from R226 743 million - the contributions of individuals and companies - to R86 649 million, or by 62 per cent (SARB, March 1999, p S-125). Part of it occurred during a time when excess savings had to be generated to effectuate a transfer of debt payments to overseas creditors. At ruling rates of taxation the redistribution of resources to the fastest growing section proved irreconcilable with a zero balance on current account of the national budget. And such balance would most likely have meant a transfer of savings from individuals and companies to government without changing the overall picture. Inroads into savings by the State have, however, not been confined to the above amounts of dissaving. Included in the amount of tax revenue actually collected is a 57,8 per cent portion (the 1998 figure) derived from progressive personal income tax and company taxation, most of which would in all likelihood have been saved if not appropriated by the State, and which did not prompt a compensatory contra on the part of the beneficiaries of redistributive State expenditure. The analysis in Chapter 12 would underscore Coale and Hoover's contention in this regard (1958 esp. ch. 16). The South African government is transforming on a large scale, savings and would-be savings into consumption in transactions which are related to population growth; and particularly differential growth; and in the process relocates saving and investment among economic sectors. The rescue or life-maintenance character of these activities is obvious, but not their productive capacity building potential. Even if life-maintenance operations do provide a supply of enterprise equi-proportional to the supply of population numbers - an unlikely event in South Africa - the sacrifice of savings and investment, the strategic factor of production co-operant with human endeavour, may still give hostages to fortune. Resources which could have been used in the formation of new capital, to raise future levels of living, have to be applied to the maintenance of proliferating numbers of the rapidly growing population.

[1] In June 1991 this was revised upward to R28 500 million (SARB, 1999, June, p. S-130).

By contrast, the depreciation allowances included in gross corporate savings can be used to enhance the productivity of the capital stock in that obsolete equipment can be replaced by new capital apparatus embodying the latest technology. Investment of the net corporate savings expands the capital stock, whose latest additions are usually also more productive than the older vintages.

In Chapter 9 it has been demonstrated that a high rate of growth of the labour force (r_L), accompanying rapid population growth (r_N), could favour the generation of S and I insofar as it raises, or maintains at a high level, the marginal product of capital. But this is only true where there are no obstacles (such as trade unions) in the way of the effective employment of the demographically driven supply of labour, a condition not satisfied in real life in South Africa. Also, such rapid growth could benefit S and I if per capita income is not prejudiced by it, since the composition of the extensive expansion of demand entailed provides a less risky market to supply than intensive expansion (increase in income per capita with r_N lagging far behind). Again, the condition has not been satisfied since 1981, 1994-1996 excepted, from which date the income per capita has been moving downward monotonically until 1993. And so, for almost two decades, the rapid increase in, particularly, Black population numbers has been an impedimentum to, rather than a stimulant of, S and I.

It is simple logic that population, and concomitantly labour force, growth requires an equivalent widening of capital (Sw) to keep the per capita endowment constant, which leaves less of it available for its deepening (Sd) and, accordingly less for raising levels of living. Making use of r_L rather than r_N, because the ICOR is defined in terms of employed labour, we have

$$Sd/Y = S/Y - Sw/Y$$
$$= S/Y - r_L \,.\, ICOR$$

Entering the appropriate data into this equation results in the following outcome for three periods selected for reasons proffered in Chapter 9, Table 9.1.

	S/Y %		Sw/Y %		Sd/Y %
1960 - 1976	12,5	-	8,1	=	4,4
1976 - 1984	11,7	-	12,2	=	-0,5
1984 - 1994	4,4	-	12,5	=	-8,1

During 1960-76, the second half of *La Belle Époque*, enough was saved to provide for the expanding population (as represented by r_L) and to leave a sizeable portion for the deepening process. The GDP in total, and per capita, grew vigorously. During the initial downward phase of the Kondratieff, 1976-1984, S was just about sufficient to have met the widening needs. During 1984-1994 S could only provide one-third of I required for widening purposes, which, if the demands of r_L prevailed, would have turned the S_d/Y component into a negative 8,1 per cent. The economy stagnated and per capita income declined.

In the neo-classical steady state growth model, population growth, represented by r_L in the above equation, would furnish its own solution to the demands on S and I entailed in the widening process by way of the lowering of the ICOR, that is, an increase in the productivity of capital (which has already been demonstrated as a theoretical possibility in Chapter 9) and for which one researcher has found some statistical support, but only in the more prosperous countries in the Third World (Isbister, undated: p. 628). The model's assumption of full employment of all factors of production implies an unencumbered influence of total labour supply, as defined by the labour force magnitude, on the marginal product of capital. And this, as already explained above, is foreign to the South African situation where the marginal product of labour has, in fact, to be raised by increasing K/L to match some wage demands which are not remotely related to demographically-determined labour supply. This latter aspect will be dealt with in Chapter 15.

The situation outlined above can be portrayed as either an inability of saving levels to match population movements or as population growth in excess of the population's ability to provide for its future needs at constant levels of living. In the absence of sustained, substantial supplements by foreigners (foreign capital inflow) investment funds are due to remain in deficit of requirements.

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CHAPTER 14

INTERNATIONAL TRADE AND FINANCE

14.1 THE CURRENT ACCOUNT OF THE BALANCE OF PAYMENTS

14.1.1 Factor endowment and international trade

With population as the embodiment of the labour factor of production, we need to enquire into the role of overall factor endowment in international trade (X and M in the system of abbreviated designations). To this end it is assumed that people's tastes, and the policy framework within which foreign trade operates, are given, and that three categories of products generated by the economy can be distinguished:

A) Non-tradeables, of which public administration, community and welfare services are prime examples.
B) Import-competing products which may, on occasion or regularly, enter into export trade transactions.
C) Predominantly export products for which the domestic demand is minimal or not significant.

The economic sectors responsible for the production of all three categories generate income which has an import demand component, while the production itself of B and C requires imports of intermediate goods and capital equipment. The more factors of production are being absorbed in category A transactions – in which determinants of a demographic nature feature prominently – the more difficult it is for B and C to effect equilibrium between X and M, particularly if A sector employment exerts upward pressure on wages.

For international differences in factor endowments to form the basis for comparative advantage in tradeables the following conditions need to be satisfied (transport costs provisionally ignored): Competition prevails allowing supply to exercise its influence in factor remuneration (which is not offset by demand for its products); factor intensities differ (unchangingly) from one product to the next; the production function of any tradeable is the same in all countries; and factor inputs are of similar quality internationally. A Heckscher-Ohlin (1933, 1949) type of foreign trade model – widely acknowledged to be the appropriate framework for examining movements in relative wages (Davis, 1998, p. 479; Krugman, 1995) – would then apply. The greater the

disparity, among nations, in factor endowments, the higher is the degree of complementarity, and the greater are the potential opportunities for international trade.

The abundant factor(s) of production, with a correspondingly low rate of return or price relative to that of the scarce factor(s), can be used to advantage as a strategic input to produce goods and services which are abundant-factor intensive in production. The results would qualify as import-competing products and/or exportables. Conversely, products which are scarce factor-intensive in production would be candidates for importation. A large and rapidly growing population, in an unrestrained labour market, accompanied by a relatively scarce supply of capital, would *ceteris paribus*, confer a comparative advantage on a country in the production of labour-intensive goods and services. A recent example of a successful application of the principle is to be observed in the very high export-led growth of the Asian tigers who entered the international market (as a first step) as producers of lesser skilled labour-intensive products. Other populous Asian countries like India, China and Pakistan, still more recently, are asserting themselves in similar fashion (Nattrass, 1998; Wood, 1997).

In accordance with the above account it is possible to distinguish between labour-intensive, capital (usually *cum* technology)-intensive, and natural resource-intensive products and industries. Within this frame of reference various sectors in the economy can be assessed as potential candidates for providing opportunities to labour-abundant (particularly semi-skilled and unskilled) economies for an internationally beneficial application of their preponderating factor of production.

(i) The staple foods producing sector. The subsistence agriculture in the traditionally Black Homelands occupies a rather singular position. It does operate in an import-competing sector. But absorbing underemployed labour, which has to seek supplementary income in migrant labour opportunities, the "absorption" is, in fact limited to the periods of resting in between rounds of migrant labour participation. In commercial agriculture the productive process becomes more labour intensive as the size of farming units is being reduced by population pressure (land tenure systems permitting) and the returns per unit of land are being maximised. The same is true of urban farming where the land input cannot but be minimal. In a study of 100 cities in 30 countries, as reported by the United Nations Development Programme, it was found that one-third of the residents were growing food for own use or for sale, releasing rural production for export or reducing

imports of food. In Moscow two-thirds of families grow food, and in Calcutta a quarter of the city's fish consumption was supplied by tanks fed with sewage (Anon, New Scientist, 1996). The converse took place in South Africa. The average size of a commercial farming unit has been ever expanding since 1952, when it was 730 hectares, to reach 1350 hectares in 1996. The labour input declined from 1 per 68 hectares to 1 per 88 hectares, while capital equipment was being substituted for it (Department of Statistics, 1976, pp 7.7, 9.4; SSA, 1999). The redistribution of land currently under way may make for greater labour intensity unless the new owners are going to practice subsistence farming, in which case natural resource intensity will prevail at low levels of productivity.

(ii) Non-staple comestibles, plantation produce and industrial raw materials. Natural resource inputs have a greater role to play here than in the first sector but plentiful labour supplies, at relatively low efficiency wages, still rank as a significant determinant of international competitiveness. The fruit industry in the Western Cape and the subtropical lowveld, and that which is irrigation-based along the Orange and other rivers, are cases in point. There is less danger here, than in the first, of population growth becoming a trade reversal force by way of rising domestic consumption.

(iii) Mining and minerals. With its endowment of minerals and metals – in contrast with the fertility of its topsoil – South Africa must be accounted a natural resource abundant country. The international demand, concomitant with the geographical uneven distribution of deposits eclipses South Africa's labour abundance as a desideratum in profitable production. However, plentiful supplies of low-skilled, low-wage labour, in combination with technology, used to serve the South African gold mining industry, and thus its Balance of Payments (BoP), well over many decades. This is no longer true as the depletion of the higher grades of ore resources is being accompanied by rigid wages. In export statistics the relevant products are likely to emerge as capital-intensive, as opposed to labour-intensive (not to natural resource-intensive).

(iv) Manufacturing. Beneficiation of minerals and metals involves a natural resource cum capital-intensive productive process, but if factor intensity attribution is limited to the L and K dichotomy the later will prevail in designation, and the derived manufactured category C products will figure prominently in South African exports. Labour abundance

can assert itself in the light manufacturing industries responsible for the production of textiles, clothing, leather products, processed foods, etc. which are the standard cornerstones of industrialisation's initial stages, and are appropriate candidates for import substitution. South Africa's problem in this regard is that whereas it has a decided comparative advantage in many natural resource-based products because of limited competition, it has to contend potentially with the competition of a major portion of the world's population in the production of labour-intensive commodities; an exercise rendered more difficult by domestic labour action.

(v) Services. South Africa owes its comparative advantage in a service export, namely tourism, to its natural resource endowment once more (climate, natural beauty, nature reserves, game parks). At the same time it serves, according to the former DG of the South African Chamber of Business as a "strong catalyst for the creation of employment for young people, first time jobseekers and women" (Parsons, 1998, pp 5,6; cf. Also Tsikata, 1998, p. 28; El Toukhy, 1998, p. 28). Its contribution (exclusive of passenger fares) to service exports has grown from 20,3 per cent in 1990 to 37,8 per cent in 1997 (SARB, March 1999, p. S-88). The other services featuring in international trade require a fairly high degree of sophistication, and do not bestow upon a large supply of labour an advantage unless it is fairly highly skilled. Eight of the world's industrialised countries are responsible for 53 per cent of international trade in services. South Africa's share lags far behind those of NICs such as Taiwan, Korea and China (The Economist, May 1996).

14.1.2 The Qualifying assumptions

Whether or not factor endowments will be commensurately reflected in a country's foreign trade will depend on whether the qualifying assumptions postulated at the beginning are being realised in practice. Those relating to production functions and factor input proportions appear to be, while not completely lacking in verisimilitude, less than fully representative of the real world, particularly that part of it characterised by economic dynamism. What with differences among countries in managerial skills, quality of labour, composition of capital, technology, climate, etc. different production functions are most likely to occur. Products are not uniquely or unambiguously factor-intense, and factor-intensity reversals do take place over time. Technology is surging ahead, changing some labour-intensive products into capital-intensive ones. It seeks

among others, to economise on raw materials by reducing wastage and increasing the final product yield of a given output of such materials, thus prejudicing the exports of labour abundant economies. The share of non-fuel raw materials and food in the total import bill of industrialised countries had diminished from 39 per cent in 1965 to approximately 19 per cent in 1988 (Gillis, et.al., 1992, p. 424). Concomitantly the real price level of internationally traded commodities (oil excluded) has been declining by one-third between 1973 and 1998 (IMF, 1999). The German Development Institute (1994) would have it that the competitive advantage based on factor endowments other than technology is waning as the latter and know-how emerge as dominant base of international competitiveness. A technology scholar asserts that "the brain content of products is increasing by leaps and bounds while the matter content is becoming less and less significant" (Van Wyk, 1991, p. 148). The Commission on Population and Quality of Life maintains that economic activities requiring an abundant and ill-trained workforce are becoming increasingly scarce (SAPA-AFP, 1994). The industrialised countries, in the meantime, with not dissimilar factor endowments, are maximising trade among themselves by means of research, invention, specialisation and product differentiation.

If, in the presence of the above developments, the potential benefits (for purposes of comparative advantage) of abundant supplies of lesser skilled labour are not to be dissipated, it has to be priced in proportion to its relative abundance – the demographically determined supply – just as the relative scarcity of the other factors of production has to be reflected in their remuneration. It is contended that the Newly Industrialising Countries of the East achieved this by limiting unbridled action on the part of trade unions, which led to the accusation, against the governments concerned, of practising less than fair labour standards. The counter-argument was that workers were amply compensated by way of increasing job opportunities at rising levels of wages as record rates of economic growth were being realised (Fields, 1990, p. 26).

As will be re-affirmed in the next Chapter, the strategy of trade unions in South Africa essentially converts abundant lesser skilled labour into a scarce factor of production. The supply of labour as manifested in the size of the labour force is not an issue at the negotiating table. It is the interests of the trade union members, however unrepresentative of the masses, that prevail. The labour force at large is prevented from determining its remuneration and employment. In agriculture, a net earner of foreign exchange, trade union activity has been mostly absent until 1997 and abundant labour was permitted to have its beneficial effect on production and exports. In gold mining, another very important net earner of foreign exchange, the increasing depth of

operations and the lowering of the gold content of ore would have been reducing the marginal physical productivity of labour ahead of restoration by means of retrenchment of workers, substitution of capital for labour and the abandonment of mines whose operations have become uneconomical. Exports declined. At times an increasing dollar price, or Rand price as the exchange rate depreciated, came to the rescue as the powerful National Union of Mineworkers sought ever increasing wages since the 1970s. The international competitiveness of many branches of manufacturing, which is a net consumer of foreign exchange to the tune of some R42 000 million in 1996/7 (Industrial Development Corporation, 1998) - and handicaps growth accordingly - is equally endangered by trade union action. An econometric exercise has put the elasticity of South African exports with respect to the price of labour at –0,348, and with respect to the price of imports, at –0,387 (Van der Westhuizen & Lawrence, 1994, p. 51).

When COSATU vowed that it was not going to allow export promotion to be based on "cheap labour" it was effectively inhibiting a prominent role for labour-intensive products in South Africa's exports. This stance implies relatively high efficiency wages. And, indeed, a researcher of the World Bank found that "South Africa is generally at a disadvantage in competing in low-wage unskilled labor intensive activities partly because of its relatively high wage level relative to productivity and, until recently, high material costs. For example, MONITOR estimated that in 1995 the cost of producing a yard of ringspun woven fabric was 0,79 US dollar in South Africa against 0,69 (Italy), 0,64 (Japan), 0,1 (USA), 0,38 (Brazil), 0,35 (Korea), 0,34 (Thailand) and 0,22 (India)" (Tsikata, 1998, p. 28; See also Nattrass, 1998, p. 82). In the activities at issue South Africa is in competition with the world's most populous NIC's and emerging economies of the East – such as China, India, Pakistan, Indonesia. With regard to China, where sustained gains in labour productivity were responsible for 42 per cent of economic growth during 1979-1994 (Hu & Khan, 1997, p. 2), it was maintained that "one hundred million unemployed Chinese crowd their cities looking for work at less than one dollar a day" (Francis, 1997, p. 22). The difference, between South Africa and China and Korea, in the use of factor endowments is illustrated in Table 14.1.

TABLE 14.1

COMPOSITION OF MANUFACTURED EXPORTS BY FACTOR INTENSITY

Factor-intensity category	South Africa 1995-96 %	China 1995 %	Korea 1995 %
Natural resources	32,0	25,2	8,6
Unskilled labour	11,8	40,5	36,0
Technology	16,1	13,1	26,9
Human Capital	40,2	19,3	26,5
	100,0	*	*

Source: Tsikata, 1998, p. 26. *The percentages do not add up to 100.

In light of our exposition above the factor intensity structure of South African manufactured exports, as in Table 14.1, does not come as a surprise. The 32 per cent share of the natural resource-intensity category appears to be congruous with factor endowments, but the 11,8 per cent of exports attributable to unskilled labour-intensive products (compared to 40,5 per cent and 36,0 per cent for China and Korea respectively) and the human capital-intensive component of 40,2 per cent (assumed to be physical capital-intensive as well), contradict the relative availability of the two factors of production. While management, co-responsible for levels of productivity, and the innate nature of metal and mineral beneficiation processes constitute part of the explanation, the limitations on the use of unskilled labour are imposed by organised labour. Capital and natural resources do not dispute the terms of their engagement; labour does.

More revealing still are the comparative data on South Africa's manufactured exports (X) and imports (M) which juxtapose capital and labour-intensities only, as in Table 14.2.

TABLE 14.2
THE FACTOR INTENSITIES OF SOUTH AFRICA'S MANUFACTURED EXPORTS AND IMPORTS

	1975		1993	
	X %	M %	X %	M %
Capital-intensive	29,5	23,8	51,8	22,3
Intermediate capital-intensive	41,0	28,3	22,2	26,1
Labour-intensive	21,4	42,4	16,8	41,5
Ultra labour-intensive	8,2	5,5	9,1	10,1
	100,0	100,0	100,0	100,0

Source: Bell & Cattaneo, 1997, pp 11, 12.

It is clear that not only are South Africa's exports more capital-intensive than her imports, but that their capital-intensity has risen between 1975 and 1993. In the ultra labour-intensive

category the percentages for X and M are not significantly different in 1993, but its share in M has been almost double that of 1975. In the non-differentiated labour-intensive class the 1993 figure for M was close to two-and-a-half times that of X (41,5 versus 16,8 per cent).

In South Africa's foreign trade the abundant human factor of production is not fulfilling the function that is expected of it in terms of its supply. Relatively scarce capital, in co-operation with scarce highly skilled labour, is required to bear the brunt of the burden.

In the case of the bulky primary products whose production is yet serving as a source of employment of low-skilled workers, the obstacle of the economics of distance has to be surmounted. As a rule the bulkier the commodity the higher are the transport costs as a percentage of the value of X. Balassa (1964, p. 369) had estimated the percentage to vary from 2 per cent in respect of tin to 40 per cent for iron ore and bananas. According to Drucker low labour cost is only efficacious in foreign trade as long as the manufacturing process is unequivocally labour-intensive. He maintained that when labour costs fell below 15 per cent of total cost the expense of distance began to outweigh the advantage of low wages (1990/91, p. 78). Technological advance has been reducing the labour cost of some formerly labour-intensive operations – for example, the assembly of radios and computers – to below 20 per cent. As it is, inland freight charges can be even more burdensome than international transport costs. A producer of ferrochrome, for instance, complained that to rail his product to the Richard's Bay port cost more than to ship it from there to New Orleans in the USA (Rosenthal, 1996).

Lastly, there is still the premised assumption of a given (unchanging) policy framework to be considered. It does not accord with reality, and particularly so during the 1990s. The liberalisation of trade, and globalisation, arising from the Uruguay round of trade negotiations, and the establishment of the World Trade Organisation in 1995, with South Africa as a signatory, effected more than just marginal changes. South Africa (designated as a middle income country) was committed to a five year tariff reduction programme and the phasing out of the General Export Incentive Scheme (GEIS); and it transpired that she had been moving faster in this regard than agreed upon in the multilateral trade negotiations (Tsikata, 1998, Annex 1, p. 4; Mittner, 1999, p. 51; Bell & Cattaneo, 1997, p. 25). The nominal rate of protection applying to the economy as a whole diminished from 29 per cent in 1990 to 15,2 per cent in 1996 (Tsikata, 1998, Annex 1, p. 10). The Uruguay round of agreements dealt rather more leniently with agriculture to the detriment of lesser developed agricultural commodity exporting countries like South Africa:

only 21 per cent reduction in volume of subsidised exports over a period of 6 years was called for, and income support to farmers was allowed. In 1996 government subsidies added the following percentages to farmers' returns from their production in highly developed economies: European Union 48, USA 38, Canada 46, Japan 74, Switzerland 82 (Mosoung, 1996, p. 11). South African farmers had to make do without such assistance (Van Zyl, 1999). The EU General system of Preference applies to South Africa, but excludes agricultural products. To secure reasonable access to EU markets for the latter, South Africa had to enter into negotiations which lasted all of four years.

The new international trade dispensation is providing easier access for South African capital-intensive exports on world markets, but also greater competition in the production of import-competing goods. The most likely outcome, in view of the exposition above, is a perverse one: an exacerbation of capital and skilled labour scarcity, and an augmentation of lesser-skilled labour abundance, which latter is not going to be allowed to be reflected in the wage level.

Distinguishing statistically the effect of South Africa's international trade on employment is problematic in a market continually shedding part of its manpower in a process of substitution of capital and technology for labour. The ILO (1998) estimated that manufacturing sectors which experienced a significant decrease in tariffs between 1994 and 1998 showed a 5,3 per cent loss in employment compared to 6,5 per cent loss in the case of those sectors operating under a regime of no, or slight, decrease in tariff rates. This was associated with an increase in (mostly) capital-intensive exports of 80,5 per cent for the former and 22,2 per cent for the latter (Institute for Futures Research, 1999). So, evidently, freer trade has acted as an unemployment decelerator; but did it have a significant impact on the tide of job losses among the lesser skilled workers? Probably not (see also Bruton, 1998, p. 931). If the results of the October Household Sample Surveys are to be credited, the employment of semi-skilled and unskilled ("elementary") workers in the formal sector of the economy declined by 21,4 and 31,5 per cent respectively, between 1994 and 1997, while that of the skilled category increased by 22,5 per cent (SSA, 1998, p. 34). Labour and ultra labour-intensive imports – some of them entering the country illegally – have been growing rapidly, reducing the manpower engaged in domestic production (Nattrass, 1998, p. 84; Mittner, 1999; CSS, 1994, 1998).

Given the poor rating of South Africa in the international competitiveness stakes, trade liberalisation is adding another dimension to the problems of the import-competing sectors which

had developed under the protection of custom duties and, for a period after the second world war, import control. In its Global Competitive Index list of 49 countries the World Economic Forum ranked South Africa forty-third, or just six places higher than the worst performer, and it was in the realm of human resources performance that she was particularly found wanting (1996, p. 15). The forum proffered the index as a measure of the "fitness of a country's economic institutions and structure to produce growth in view of the overall structure of the world economy" (p 12). This arrearage is reflected in the probable effects of trade liberalisation on South Africa's manufacturing industry over the period 1995-2002 as projected by ILO researchers.

TABLE 14.3
PROJECTED PER CENT CHANGES IN EMPLOYMENT BY FACTOR-INTENSITY OF PRODUCTION

	Aggregate	Change in Exports	Change in Imports
Capital-intensive	-0,3%	4,5%	1,8%
Intermediate			
Capital-intensive	-1,3%	-0,5%	8,2%
Labour-intensive	-3,4%	-6,6%	2,1%
Ultra labour-intensive	-1,8%	-8,2%	7,0%
Total	**-1,7%**	**0,4%**	**4,1%**

Source: Bell & Cattaneo, 1997, pp 21-22.

According to Table 14.3 employment in only capital-intensive export industries is due to benefit, while increased imports of labour and ultra labour-intensive products will be reducing the employed labour force of the light manufacturing industries. The sectors producing the basics of human life are increasingly unable, in consequence of international competition, to provide the wherewithal for the acquisition of such basics through employment.

14.2 POPULATION AS SOURCE OF DEMAND

The discussion above has already showed up the discord between the exigencies of foreign trade and South Africa's factor endowments as it surfaces in the disjunction of the supply and the use of labour, which is a source of disequilibrium in demand for exports and imports. It produces a bias in favour of imports. Demographic forces have been, and are, producing a labour abundance whose function in international trade is confined to the consumption of imports, rendering equilibrium in the BoP current account and, accordingly, a reasonable and sustained rate of economic growth, progressively more difficult. Even labour which does make a contribution to

South Africa's manufactured exports is yet responsible for an excess of imports by way of capital and intermediate inputs needed to sustain or expand production.

There remains the function of population as determinant of the size of the domestic market to be taken into consideration. The latter can be measured by population size (N) (as affected by its composition) multiplied by the income per capita (Ypc); NYpc that is. To pre-empt the frustration of inferences about the influence of N we have to abstract from population quality differentials (consistently defined as a function of entrepreneurship endowment) between large and small countries, and to premise a "tolerable" level of Ypc which is not being reduced by an expanding N. In addition it is assumed that a state of complete globalisation, which deprives governments of all forms of intervention in a world which constitutes one unencumbered, comprehensive market, does not obtain. Which means that a nation can opt for predominantly import-competing, inward-industrialisation (substantially international trade-dissociative, i.e. depending on the dynamics of the internal market), or for outward, or export (associative), orientation as strategy for economic development, though some degree of combination of the two is not an unusual occurrence. The size of the domestic market can play a decisive role in the choice. Its importance is founded in the following attributes: a lesser degree of business sophistication and effort is required to the benefit of the "infant" entrepreneur to supply it than foreign markets, which latter can erect protectionist barriers; it can, if large enough, allow the attainment of the economies of scale, or a minimum of efficiency, in a variety of products domestically demanded; it can provide the base from which export operations can be launched in which recourse can, for example, be had to marginal cost pricing to enhance competitiveness in foreign markets – some supporting evidence is proffered by an econometric exercise which indicated that domestic sales and exports were complementary, the quantity of exports responding by 0,479 per cent to a 1 per cent increase in the price of domestic sales (Van der Westhuizen & Lawrence, 1994, p. 51); to the extent that it affords a nation command over a portion of its economic activities it reduces the impact of external influences on a country's welfare. The magnitude of these potential benefits in terms of foreign trade operations is positively correlated with the size of the domestic market and, hence, with N.

The widening of the market accorded by the addition to N is, indeed, the basis of the argument for regional integration or the establishment of common markets. "Economies of scale in production are allowed which could permit the establishment of industries that would not be viable at lower levels of output", argued McCarthy in favour of Southern African regional

integration (1992, p. 7). And Senghaas claimed: "The fact that societies like that of Japan had a large population, and that their development process began relatively late, allowed the dissociative bias of development policy to continue for a long time ..." (1985, p. 34). While pointing out that none of the countries now highly industrialised has developed under a régime of continuous free trade, he concluded that "populous territorial states are protected by their very size, for the larger the population the smaller the relative GDP share of foreign trade" (p. 27) (see also Allen, 1981, p. 232). It has been estimated that, with a Ypc of 700 US dollars, a country which has fewer than 25 million inhabitants is likely to experience an export level of approximately 25 per cent of GDP compared to 15 per cent for a typically large country with the same income per capita (Gillis et.al., 1992, p. 417).

The smaller the domestic market and the average size of its enterprises, the greater the risk that its industries can be harmed, or even destroyed, by imports from large foreign suppliers of whose production those imports constitute a minuscule portion. The production cost of these foreign supplies – particularly in the case of end-of-season leftovers – could be regarded by producers as of historic interest only which is to be ignored, if unsaleable in the country of origin, to render gross proceeds the equivalent of profit. Anti-dumping legislation cannot be effective if dumping is to be proved after an industry in the small country has been put out of business. At the same time the economic limitations imposed by the domestic market of such communities oblige an export oriented strategy for purposes of economic development. "Most cogent reasons for import substitution", according to Ray (1998, p. 676), "disappear for countries that have small internal markets. Such countries must fight their battles on the world market from day one".

However, when large and rapidly growing populations do not meet the qualifying conditions posited above, they could be equally vulnerable in respect of their BoP. If they are meagrely endowed with entrepreneurship and their economies are heavily dependent on agriculture whose returns to increased application of labour are diminishing, a drought is most likely to cause a deficit on the BoP. The population elasticity of demand for food (and other basic needs) which is close enough to 1, in conjunction with price inelasticity, will prevail. Hunger or famine may occur in the absence of imports. When the maize crop of South Africa – though not classified among the "developing" category of nations, even while the economic situation of a major portion of its population would answer to that description – plunges from 10 or 12 tons to 4 tons, as has happened, a large amount of foreign exchange is forfeited due to the lack of exportable surpluses, while, in addition, scarce foreign exchange has to be expended to import some 2

million tons of maize. This may be regarded as a short run trade reversal. A chronic or structural trade reversal eventuates when the limited land area of a country can no longer sustain the growing population whose consumption can only be maintained by means of regular imports. In Chapter 7 on natural resources we already had occasion to refer to erstwhile exporters of food who had become importers. Previously able to support itself, Africa had, by 1989, to import 35 per cent of its food, and is becoming increasingly dependent on food aid (Rhomire, 1992, p. 142). In these circumstances, the larger is the population and the faster its growth, the more difficult is the attainment of equilibrium in the BoP current account.

Prebisch (1959, 1971), a one-time secretary-general of the United Nations Economic Commission for Latin America, advanced the thesis, based on Latin American experience, that both the demand for, and labour supplies of, the fast growing populations of the poorer countries, in their dealings with the richer industrialised ones, militate against their economic interests. He proffered a model of a world consisting of an economically advanced centre and an underdeveloped periphery. In the labour scarce centre trade unions and monopolistic markets result in prices which rise, but never fall, when technological progress occurs. In the periphery, where labour surpluses are prevalent and markets are more competitive, this progress leads to falling prices and stable real wages. Its growing labour force has to be employed in economic pursuits of declining productivity which exerts downward pressure on wages. It is also disadvantaged by the centre's income inelastic demand for its exports, which are primary products for the most part, while its demand for the centre's exports is highly income elastic. Accordingly, efforts to increase its foreign exchange earnings by lowering its prices does not meet with success. Its exports lag behind imports when demand increases in both centre and periphery, leading to declining terms of trade and deficits on the balance of payments for the latter. The developed world captures all the benefits of economic progress.

While Prebisch's portrayal of the differences between First and Third World is valid, his conclusion about the terms of trade (the net barter terms, that is) has been found wanting. The historic evidence for different periods is mixed and many researchers have found that the Prebisch hypothesis cannot be sustained (Staley, 1970: pp. 166/7, Gillis, et.al., 1992: p. 426). However, the World Bank reported in its *1990 World Development Report* (p. 13) that during the nineteen-eighties Sub-Saharan Africa had, as a result of a fall in the prices of their exports, been deprived of 15 per cent of real import purchasing power (the income terms of trade). To the

extent that this can arise from population pressure, proliferating numbers are, on this score, a liability, not an asset.

The post-1940 experience of South Africa appears to have contrasted with the logic expounded above. When this country began its import substitution process it was still a small country with a limited domestic market as measured by its 1946 population of 12 400 000. Bolstered by high customs duties and import control the operation flourished for a considerable period of time. Since import substitution did not reduce levels of imports, but raised them, due to the demand for capital and intermediate goods required for economic growth, the success should be attributed to the performance of its commodity exports. These have been favoured by the war conditions and the post-war reconstruction of war-ravaged Europe and Japan, which also limited the competition South African producers of consumer goods for the internal market had to cope with. These auspicious circumstances, as was to be expected, did not endure, while the quality of gold ore reserves – in the past a major source of foreign exchange earnings, and one which does not have to brave the kind of competition ordinary merchandise is subjected to – was diminishing inexorably, to register a share in exports of 13,5 per cent in 1998, compared to 40 per cent in 1984 (SARB, March 1986, p. S-62; March, 1999, p. S-84).

By the end of the century South Africa had become a medium-sized country with almost 45 million inhabitants. But it had not yet managed to reduce the share of capital and intermediate goods in the merchandise imports bill significantly below 80 per cent (Industrial Development Corporation, 1998; Hawkins, 1996, p. 206). The size of the domestic market is presumably still too restricted to allow of the economies of scale being realised in this respect. Population size does not, however, appear to be the obstacle. During the hey-day of import substitution, when this matter was very much at issue (and probably exhaustively discussed) it was considered that 45 to 50 million inhabitants would be adequate for the purpose. The problem resides, rather, in the level of the Ypc: upward of 40 per cent of the South African population can be regarded as not fully integrated into the modern sector of the economy, which portion can be delineated as economically marginal (E.M.P.) embodying the underemployed and most of the unemployed members of the labour force.

In consequence, the nature of South African merchandise imports and the direct link of their volume to economic growth (to which they function as prerequisite) denote that the latter is

unremittingly constrained by the BoP current account – to a rate of approximately 2 to 2,2 per cent per annum[1] - in the absence of the required financial accommodation by the capital account.

14.3 THE CAPITAL ACCOUNT

Any circumstance that impacts upon the current account has significance for the capital account, the latter registering not only the flow of foreign capital, but also the movement of a country's foreign exchange reserves (which are presumed to be just enough to act as a safety valve, and not to finance chronic deficits). Hence, the analyses in all the Chapters from 11 onwards are relevant. This is summarily captured in the national accounts system of designation (but disregarding transfer payments registered in the services account):

$$X - M = GNP - GDE$$
$$= (C\text{-}C) + (T\text{-}G) + (S\text{-}I)$$

A surplus of X features in the capital account as an addition to foreign exchange reserves, which also means an augmentation of the quantity of high-powered money, of the ability to finance future imports or to invest in foreign countries. It is unlikely to be considered a economic problem. Rather it is an excess of imports, signalling that domestic expenditure exceeded national production in value, and requiring a compensatory amount on the capital account, that is regarded thus, unless the country at issue is economically powerful enough to have its currency accepted by outsiders as forex reserves.

The equivalence of the two C magnitudes above can mask the fact that not all the consumer goods consumed have been domestically produced. When, as is likely happen in the lesser developed communities (LDCs), the accumulation of factors of production other than labour fails to match population growth – which can be denoted as a population-related structural deficiency (PRSD) – to the extent of inhibiting the production of an adequate supply of food, or of exports to buy food – the supplementation by First World donors emerges as a sort of moral imperative. By implication the economic burden of improvident parenthood is shifted internationally from the poorer to the more affluent nations where parenthood is very limited in scale. UNICEF, whose function it is to promote the interests of the world's children declared categorically: "The

[1] Other writers have estimated this rate at around 3 per cent (Van der Walt & De Wet, 1994).

fact of the matter is that significant increases in aid will have to be paid for by the taxpayers of the industrialised nations" (Eberstadt, 1995, p. 236). The flow of capital from the highly developed to the least developed countries consisted overwhelmingly of concessionary government transfers to governments of the LDCs in question, in the form of grants, repayments not required, soft loans and some commercial lending. Some governments in Sub-Saharan Africa (SSA) paid, or had to pay less than 2 per cent interest. Between 1977 and 1986 only 5 per cent of the net flow originated in the private sector which, understandably, is interested in market related rates of returns (Eberstadt, 1995: p. 207). This sector's decisions on the location of foreign direct investment is positively related to market size in which a large N has a role, but then only when it is accompanied by levels of Ypc considered "tolerable" or "satisfactory" which are not negatively correlated with increases in N. "Larger economies" it has been reported, "attracted the bulk of foreign direct investment. This is because of the potential for local sales and also the existence of more diverse resources that make local sourcing more feasible" (El Toukhy, 1998, p. 473). The discovery, in a small, poor country, of an exploitable natural resource of which the world is in short supply, can cause a deviation from this tendency.

It has been suggested that if international government aid to some of the SSA countries were to be terminated they would simply cease to function. For example, in 1997 it constituted 38,3 per cent of Tanzania's GNP, 85,4 per cent of Somalia's, 87,8 per cent of Mozambique's and 123 per cent of Rwanda's (Versi, 1997, p. 37). Large repayable foreign debts have been accumulated as a result. That of SSA (exclusive of South Africa) increased from 63 000 million US dollars in 1981 to 166 500 million dollars in 1993, the debt/GDP ratio reaching 123 per cent in 1993 (Baynham, 1993, p. 3; Sonko, 1994, p. 39). During 1990-93 the servicing of the debt absorbed some 19 per cent of SSA's export earnings, while rescheduling of the debts and additional borrowing, to pay for the servicing thereof, reduced the loss of foreign exchange temporarily only to raise the level of indebtedness in a vicious spiral of circular causation.

It is agreed that their external debts are a millstone around the necks of SSA. The reason is that the funds have not been invested productively and, particularly, have not created the export capacity required for the servicing of the debts. The blame can, apparently, be laid, in part, at the door of government policy and maladministration. It has been averred, for example, that food aid got stuck to the fingers of bureaucrats and government élites in some of the receiving countries (George, 1987: pp. 5,6) while in others it became a substitute for local production (the cargo-cult phenomenon). But a significant factor has been the high proportion, of the debts incurred, that

has been used to finance the importation of food (Rhomire, 1992: p. 144; Fair, 1994, p. 144), which did not entail a release of resources for application in projects of development, but served to prevent proliferating human numbers from suffering hunger or dying. Some of the aid channelled into investment projects proved to be white elephants (Versi, 1997, p. 38).

In consequence, pressure has been brought to bear upon creditor nations to write off these debts or exempt the debtors from part of their obligations. UNICEF (1990) leading the indictment of the former, would have it that the Third World debt crisis was responsible for the death of half a million children under the age of five, because of the cutbacks in health services necessitated by the payment of interest on, and redemption of the debts. The response to this of a researcher (Eberstadt, 1995: Chapter 10) was that the net transfers of funds to the Third World, during the time the contrary was contended, continued to be positive, that there was no evidence that child mortality had not continued its historic downward trend and that if the governments concerned did not increase their expenditure on health and education it was because they chose to do so, and not because of the demands of debt servicing.

A quote from the twice-monthly Report of the World Development Forum may relay the quintessence of the problem: "What everybody knows, but few have been willing to say publicly: all the multi-billions in loans and other aid to the Third World countries will go down the sinkhole if those countries do not adopt tougher birth control programs ... Third World aid without birth control is like trying to pour water uphill" (1988, p. 1).

In South Africa both the substantial EMP component of the population and the modern manufacturing sector – which is presumed to create jobs for them – do not generate enough forex to satisfy their own need of it. The low income levels of the EMP imply negligible saving. Their maintenance through the national budget by way of social services and relief programmes adds to the dissaving (T-G), which reduces the aggregate Savings (S) required for Ypc – maintaining or – enhancing investment (I). If we postulate that the GDP growth rate, to be consistent with a zero (X – M) value, should not exceed 2,2 per cent per annum, then up to the beginning of the 1990s population growth exceeded that limit. Which meant that an inflow of foreign capital had to come to the rescue, which it did fairly regularly until 1981 (SARB, 1994, June Supplement, p. B-148), the last year of a long period of rising Ypc. From 1985 to 1993, arising from foreign disinvestment and obligatory repayments of debts, large positive amounts of (S-I) had to be generated to finance the transfers on capital account. As a result domestic I and Ypc could not be

maintained, while the foreign exchange rate of the Rand plunged, raising the costs of M and the levels of inflation. After 1993 the process has been reversed, as indicated in Table 14.4, so that it became possible for economic growth to exceed population growth for some years.

TABLE 14.4

THE CONTRIBUTION OF FOREIGN CAPITAL TO SAVINGS
R'000 000

	1992	1993	1994	1995	1996	1997	1998
Gross domestic savings	58188	65903	73899	81931	91661	90140	91697
Gross Investment	53213	59854	75106	91856	98953	98953	105163
BoP capital account	-4975	-6049	1207	9925	7292	8813	13466

Source: SARB, March 1999, p. S-125.

It is seen that foreign capital made a very sizeable contribution to the financing of investment in South Africa during the four years 1995 to 1998, after recording net outflows over a period of ten years.

With population growth down to below 2,0 per cent per annum since the middle 1990s, the BoP should, *ceteris paribus*, prove to be less of an impediment to its economic accommodation; unless the expansion of the EMP component nullifies such tendency. At the same time, the volatility in international capital movements ensuing from globalisation, in conjunction with a less than satisfactory credit rating, introduces greater uncertainty about the availability of foreign funds for domestic capital formation as well as the international value of the currency. "The risks of self-fulfilling runs on national currencies", confirmed Rodrick, "have been magnified by the explosion in short-term liquidity, and countries are under greater threat of contagion from financial crisis elsewhere" (1998, p. 5).

14.4 IN SUMMARY

The benefits to be derived from international trade are associated with the application of the principle of comparative advantage in the employment of available factors of production. If the production of exports and imports were unchangingly and internationally uniformly factor-specific, (in terms of dominance), while factor remuneration were directly related to their scarcity (inversely to their abundance), the abundance of lesser skilled labour, stemming from rapid population growth, could be expected to accord South Africa a comparative advantage in the

production of labour-intensive merchandise. The expectation is not substantiated by statistical evidence on exports and imports. This outcome is a function of the following circumstances: factor combinations required in the production of undifferentiated export and import items are not unique or unchanging; South Africa is, apart from lesser skilled labour, also well endowed with advantageously marketable deposits of minerals and metals, the beneficiation process, if not the recovery, of which is capital-intensive, in addition to being natural resource-intensive; trade union intervention prevents the remuneration of lesser skilled labour from reflecting its abundance; and South Africa has to compete with populous countries where labour abundance is equally, or even more, pronounced and is allowed to be expressed in the levels of efficiency wages.

The section of the population which becomes economically marginalised in consequence and does not contribute to exports is nevertheless responsible for some portion of the import bill, thus making the achievement of BoP equilibrium more difficult. The expanding EMP, moreover, reduces the possibility of a domestic market size in which the establishment of adequate import-competing capital and intermediate goods industries becomes a viable proposition. With the maintenance or expansion of production depending on these latter as inputs, their price elasticity would be low, and a depreciation of the Rand – vulnerable as a result of both current and capital account – while advantaging export industries, raises the costs and prices of the importers which may also be exporters. Their continued international competitiveness is not ensured by a single round of depreciation.

The economy is rendered inflation-biased. Inasmuch as the SA Reserve Bank is avowedly committed "to protect the value of the South African currency" (SARB, March 1999, p. 92) it would tend to pursue monetary policies which, at the same time, restrain capital formation and, thus, growth.

In these circumstances – and particularly during the last two decades of the twentieth century – there is (has been) little or no benefit to be derived from South Africa's large and expanding supplies of lesser skilled labour. Human quantities unsupported by appropriate economic qualities, and unwilling or unable to submit to the remuneration outcomes that would be imposed by population related supplies in an unencumbered labour market, do not impart international comparative advantage. Free trade is effectively enhancing the abundance of this factor of production which is not permitted to affect its remuneration. Increased unemployment is

inevitable except in the unlikely event of labour being persuaded to raise productivity without concomitant compensation. For international trade to generate employment for this abundant factor of production "cheap labour" (low efficiency wages) is manifestly an imperative. In this regard trade liberalisation and COSATU are incompatible.

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CHAPTER 15

SUMMARY AND CONCLUSIONS

15.1 INTRODUCTION

The presence in South Africa of demographically and culturally distinguishable population groups, ranging from the lowest fertility component (LFC), the Whites, to the highest fertility component (HFC), the Blacks, facilitated the demonstration of the economic effects of population trends, with particular emphasis on those associated with the HFC.

The quintessence of the analyses in the aforegoing Chapters is that there is little or no economic merit in proliferating human quantities if they are not accompanied by commensurable human qualities required for economic growth and development. The outcome of the absence of such concomitance can, in sum, be portrayed by juxtaposing the consumer and producer roles of population as embodiment of consumers and of the two human factors of production: (i) entrepreneurs (ENT) and (ii) the rest of the labour force (L).

15.2 THE POPULATION AS CONSUMERS

The potential economic merit of a rapidly growing, youthful population or community (inhering, that is, in the N factor of Nx Ype) resides in consumption which, in itself, does not require talent, enterprise or exertion, and cannot be sustained in the absence of production which does demand such attributes. The merit is of dubious avail when, as in South Africa's open economy, consumption has, directly and indirectly, a substantial import content and its sustainment requires sizeable transfers and redistributional social service provision by government. Growth-inhibiting BoP problems and low savings levels are the result. With its numerical preponderance, the HFC - its numbers increased 4,95 times during the period 1936 to 1999, compared to 2,53 times in the case of the LFC - is possessed of a countervailing force to its PRSD-induced poverty in the form of an unassailable majority in South Africa's universal adult suffrage elections since 1994. The political power thus acquired allows of an (intensified) redistribution of income through budgetary policy, apart from a host of other measures meting out preferential treatment to the HFC. The consumption bias of natural, provincial and local government budgets is enhanced and is being aggravated by the ensuing government dissaving and the servicing of the concomitantly accumulating national debt.

The approximately unitary population elasticity of this consumption introduces a degree of stability into the economy. But it is a stability of relative stagnancy, the consumption for the most part being confined to basics of life, or survival goods, instead of prosperity goods that economic vitality is associated with. Before the onset, in 1982, of the long-run downtrend in income per capita South Africa's economic growth would have benefited from the role of rapidly growing population numbers in consumption. Thereafter its influence was overshadowed by other, hostile, factors in the economic environment, and it became a Ypc-depressing factor. Whatever stimulus the proliferation of human numbers as such - unadorned, that is, with requisite economic qualities - may provide to the economic process, it does that by way of resource-depletion, not of resource-creation, which, in the case of natural resources, spells loss of future productive capacity and impoverishment. The resource-creative role is fulfilled by the five factors of production acting in unison, in part substitutionally and in part complementally. For each of them quality is as important as quantity, and, in the case of the two human factors of production, crucially more so.

15.3 THE POPULATION AS PRODUCERS

15.3.1 *Entrepreneurship*

The supply of enterprise, as implied in Entrepreneurship (liberally associated with those in executive positions) can be denoted by ENT x Ach in which ENT stands for the relative number of entrepreneurs and Ach for the level of achievement of the average executive. The South African supply of enterprise, which has been presented in Chapter 6 as the *fons et origo* of economic growth and development, is lacking in both respects. The scarcity of this factor of production, and the likelihood of its exacerbation in time to come, are evidenced in the following comparison, by population group, of labour force (Lf) growth and relative numbers of entrepreneurs:

	Whites	**Asians**	**Coloureds**	**Blacks**	**Aggregate**
1996-2006 LF growth p.a.	0,5%	1,8%	1,7%	3,3%	2,7%
1996 Entrepreneurial content of LF, %	13,3%	5,8%	1,1%	0,2%	2,6%
Growth of entrepreneurial component 1996-2006 per annum					0,8%

It is seen that the HFC, most in need of it, is the least well endowed with this factor of production. This is a critical economic-demographic imbalance. It will need a great deal of upward mobility and emergence of new talent among this group to raise the growth of the entrepreneurial content of the LF from 0,8 per cent to equal that of the aggregate LF, which is 2,7 per cent per annum. Since the HFC is the major contributor to the size (71 per cent) and growth (91 per cent) of the LF it will also have to be the major source of supplementation's to the supply of enterprise to obviate rampant unemployment, if not economic retrogression. So far the overwhelming majority of entrepreneurs have sprung from the ranks of the LFC; but their share in the aggregate LF was only 16 per cent in 1996 - and projected to decline to 12 per cent by 2011 - and it is not to be expected that the entrepreneurial content of the LFC could expand significantly beyond the present level, or that the Ach factor could compensate for the numerical deficiency. As employees, they have been depicted as practitioners of a paternalistic, authoritarian style of management "focused on control and not in the softer issues such as motivation and participative management" (Mittner, April 9, 1999). And, having to contend with stresses engendered by the medley of Western and African cultures and an aggressive labour movement, they fail to elicit the most efficient performance from their workforce.

Those of them employing 50 or more persons, (designated employers) are coerced by law to institute affirmative action (AA) measures "to ensure that suitably qualified people from designated groups (Blacks, women, disabled persons) have equal opportunities and are equitably represented in all occupational categories and levels in the workforce of a designated employer" (RSA Employment Equity Bill, Section 15(1)). This, stipulates the Bill, is not to be interpreted as an "absolute barrier to the prospective or continued employment or advancement of people who are not from the designated groups" (section 15(4). In other words, there could be exceptions to the rule that preferential treatment is to be meted out to the designated groups. A candidate will be "suitably qualified" not only because of formal qualifications or prior learning or relevant experience but also because of a "capacity to acquire within a reasonable time the ability to do the job" (section 20(3)). This is backed up by section 20(5): "an employer may not unfairly discriminate against a person solely on the grounds of that person's lack of relevant experience". Employers are required to prepare plans indicating how progress is going to be made towards the implementation of AA goals ("representivity") over a period of 1 year (minimum) to 5 years (maximum), and thereafter to submit job audits reflecting the demographic profile of their workforce at different occupational levels. Contravention of some provisions of the law is punishable by fines ranging from R500 000 and R800 000. The burden of proof is on the employer.

This legislation is an extension, to the private sector, of the principles enunciated in the government's AA programme for the public sector, where, within five years' time, members of the designated groups have replaced some 60 per cent of the holders of office at the managerial level (Giliomee, 1999), entailing an inevitable loss of expertise. Although the attainment of goals in the private sector appears to reflect a lower level of urgency, the economic effects are likely to be similar. It can be inferred that candidates entitled to preferential treatment need have no experience and no qualifications other than an untried and unproven "capacity to acquire the ability to comply with the requirements of a job". "Suitably qualified" thus defined is alien to the Eurocentric entrepreneur's perception of merit as condition for appointment. During the period of training of an AA appointee - which at the managerial level could be lengthy - his remuneration represents an unrequited cost. Or when his employment represents no more than tokenism, the cost continues until he resigns because he suffers the frustration of being side-tracked.

Implementation of AA at the managerial level proves to be fraught with difficulties. It has been contended that "the lack of understanding between the two main cultures within South Africa's big companies ranks as the main reason why there are so many problems with the effective integration of black managers into white business ... It is obvious white and black basically continue to live in separate worlds" (Mittner, 1999, March 5, p. 26). White managers are accused of retaining "the belief that Blacks are incompetent ... and that affirmative action lowers standards" and resignations of top Black managers occur frequently because "they feel alienated from the predominantly white culture or experience racism in the workplace" (Mittner, 1999, April 9, p. 24).

The obvious way for the alienated, around the problem is either the application of individual entrepreneurial initiative in the founding of an own enterprise, or being offered opportunities in culturally kindred enterprises such as those established by way of Black empowerment. This latter process (started by private sector businessmen as gesture of beneficence to the disadvantaged) is being advanced by the conditions imposed by section 53 of the Employment Equity Bill which requires that employers submitting tenders for state contracts have to demonstrate that they are advancing the cause of AA. Black-controlled companies would, therefore, qualify automatically and have the advantage of a preferential rating, while they are being favoured by the formulation of conditions of tender. They have, for example, been awarded government contracts (over the period April to December 1998) worth R4 100 million out of an aggregate of R8 600 million, which ratio bears no relation to their contribution to the

GDP (Finance Week, 1999, March 26, p. 7). In the case of the bidding for State-owned forests, it has been asserted that "many empowerment companies bring nothing to the table. Most add neither management expertise nor money" (Finance Week, 1999, April 16, p. 9).

This policy can be likened to the application of the infant entrepreneurs (infant industry) principle. Only, in this case the action is not directed against foreign competitors. And, instead of enhancing the ability of the infant industries to compete against foreign suppliers in the domestic market, it is more likely to enervate it. In essence, the action is retrogressively substitutional rather than additive; a substitution of a less efficient resource-use for the more efficient use. Economic growth is constrained. And there is no certainty that the cause of equity is being served. The economic system sponsored by the post-1994 government has become known as crony-capitalism, in which the HFC rank and file are not the prime beneficiaries, while intra-HFC inequality is burgeoning (Giliomee, 1999; IFR, 1998).

The economic cost of the iniquities of apartheid for which restitution is sought - and the non-economic elements of which have probably been more offensive to the underdeveloped HFC than those of an economic nature - is indeterminate; which renders it a useful medium in the advocacy of government action. Once having identified apartheid as the root of all ills - by weight of numbers in the political process, among others - and, thus, the unique cause of the HFC's economic arrearage, examination of equally, if not more, significant co-determinants - such as demographic and cultural factors - is rendered nugatory. The paradigm thus established permits of measures economically injurious to the population in the aggregate while benefiting some individuals whose personal claims to restitution are also indeterminate.

Having in mind the results of precipitate AA in the public sector, the enforcement of AA in the private sector does not have the flavour of a recipe for economic success. Placing hurdles in the way of the factor of production at the pinnacle of development is economically debilitating. The successful fulfilling of its function is already arduous enough not to be burdened with policies which engender an enterprise-inhospitable environment. It is not in the interest of employment creation.

To judge by the articulated wish for an African renaissance and pronouncements in similar vein, together with an acceleration of the trend towards the small family system among the HFC, South Africa would conceivably enter upon a new era of entrepreneurial initiative at the turn of the century. A Black executive chairman of an advertising agency has confidently declared that

"there is a new breed of young African people who know what they are about, extremely well educated ... and they are saying the predominant culture is Black, this country is on the African continent, that is has a Black majority and that it is African people who are going to set the tone of change and everybody else must just follow or leave the country" (Democratic Party, 1998, p. 14). In the context of this discourse the words requiring elucidation are "the tone of change". Do they connote the discarding of the prevailing Euro-oriented corporate culture? If they do, is eminence of achievement going to be the watchword as reflected in the attributes encompassed in the profile of an entrepreneur? Or are they a manifestation of η-power in which maximum economic progress and employment are not prime considerations?

At his inauguration, President Mbeki, the expounder of the Africa renaissance conception, stated that South Africa could no longer falsely be labelled as an European outpost. Geographically and in terms of the origins of the majority group and their political control this is incontrovertible. Adjudged, however, by the composition of the economic growth initiators the South African economy has been the creature of Western traditions, whatever failings in other respects they might have manifested. Less than reassuring is the view of a Black academic that Africa has failed economically because of flawed value systems (Ramogale, 1997, p. 10); and the conviction of the managing director of a parastatal (an AA appointment) that "Black South Africans needed to undergo a cultural transformation if they wished to influence the economic transformation of the country in any meaningful way" (Business Reporter, 1996, p. 13). But the transformation towards a welfare or socialist state advocated by a partner in the governing alliance, COSATU, in which "the main motive forces ... are primarily represented by African workers and the African rural poor" (COSATU, 1996, par. 5.9) has the character of the abnegation of individual responsibility associated with entrepreneurship. And Curriculum 2005 does not radiate a quest for distinction in school careers to lay a groundwork for achievement - in the economic sphere, among others - in later life.

Supportive of the qualms comprehended in the above estimations is the conclusion of Bruton, after reviewing relevant literature and acclaiming the "hard slog" approach of East Asian firms: "... no quick and easy fixes to development problems are available ... The achievement of the hard slog in turn requires consideration of the more fundamental aspects of society - entrepreneurship, institutions, values, social incentives, commitment to growth and a variety of other factors that define society ... having roots deep in the ethos and history of a society [which] requires that explanation and policy prescription probe these precincts that are so alien

to mainstream thinking" (1998, pp 930/933; also Klitgaard, 1994, p. 491). It is these "softer issues" in Economics that have to be addressed; a central theme in this dissertation.

If the diagnoses thus proffered have prognostic value, given the demographic imbalance, the outlook inspires less confidence than is to be inferred from the enthusiasm of the executive chairman cited above. In the meantime South Africa, which owes a great deal of its economic development to immigration from the highly industrialised countries, has been suffering net losses, through emigration, of growth-initiating manpower (SSA, 1999, pp 20/21).

15.3.2 *Labour*

The supply of labour can be portrayed as $L \times S_K \times PE$ in which L stands for the (non-executive) LF numbers, predominantly determined by demographic forces, S_K for the skill content of the average worker as generated by education, training and experience and PE for the intensity of productive effort of the average member of the LF, which is a function of workers' attitudes, work ethos and the attitude and quality of management. A single index of Sk can be conveniently arrived at by weighting each skill category with its potential employment multiplier on the assumption that each of them is a prerequisite for the employment of the lower orders, the lowest being awarded a weight of 1. The PE factor cannot be captured in a statistical magnitude in like manner, and is usually assessed by way of international comparisons in which, as portrayed in Chapter 14 on international trade, the South African labour force features inferiorly. Changes in PE over time are, however, being proximated by means of value added per worker (Y/L) the amount of capital per worker (K/L), and multiple or total factor productivity (TFP). Any poverty that is being caused by large families and proliferating numbers, is very likely to impact adversely on PE.

As a result of the declining fertility of the least developed community (the Black population) which has been preceded by very high levels, their LF numbers are growing faster than their population in the aggregate, 2,7 per cent per annum against 2,2 per cent projected for the period 1996 to 2006. The potential economic benefit of this differential, like that of their high co-efficient of LF replacement and renewal, becomes a non-event when it is dissipated by a lack of job opportunities to allow its materialisation. The influences of fertility on female labour force participation has been waning, both because of its historic decline and because maternity by itself has become less of a consideration in attachment to the labour force. Among Black women it has never been a significant consideration. Their high birth frequency could, however, have an

adverse effect on their productive effort. The female labour force has been, and will continue to be, growing faster than the male component.

The value of Sk of Blacks is just over one-quarter of Whites', one-half of Asians' and three-quarters of Coloureds' levels. Over time, however, 1965 to 1991, its level has risen by 17 per cent compared to a stationary level among Whites, and an improvement of 20 per cent for the Coloured, and 39 per cent for the Asian population. But the combination of the low skill content of its LF and its dominant 72 per cent share in the LF increment, restricted the improvement in the total South African workforce to only 5,4 per cent during the period in question. The low skill content of the majority group coincides with a low level of educational achievement, 38 per cent of those 20 years and older not having passed standard 5, and 72 per cent having passed standard 8 or a lower school grade (Central Statistical Service, 1996,p. 78). The large majority also seems to be unprepared or financially unable to serve artisan apprenticeships.

The PE factor is equally uninspiring. The World Competitiveness Report ranked South Africa worst among 48 countries with regard to the "people factor". The South African collaborator in the drawing up of the report maintained that "the values of society do not support competitiveness. People in our country lack energy and enthusiasm" (Marud, 1995,p. 5) and the former executive director of the National Productivity Institute believes that the South African value system was not conducive to productive behaviour (Annual Report 1996). The Unisa Graduate School of Business Leadership, in a comparative study of five countries, found that a South African project leader would need an input of economic resources 2,6 times, 2,8 times, 3,0 times and 3,1 times that which a New Zealand, an Australian, an American and a Canadian opposite number respectively would require for a similar project (Booyens, 1997,p. 3). Labour productivity increased by 160,5 per cent during 1975 to 1992 in Taiwan, compared to 11,3 per cent in South Africa (Breier, 1995). In the automobile industry the South African worker averages a production of 7 units per annum compared to 11 for an Australian, 12 to 13 for a European and 40 for a Japanese worker. The average number of defects per 100 cars assembled in Japan is 50, in the USA 75 and in South Africa 350 (Du Toit, 1995,p. 11). In a study of productivity growth in the SA Manufacturing sector, broken down into capital intensive, intermediate capital intensive and labour-intensive industries, the increase (for 4 periods) in value added per worker was decomposed into a capital deepening factor and a residual designated as total factor productivity (TFP), reflecting improvements in the quality of capital and of labour (a possible proxy for our PE). Capital deepening emerged as the predominant factor, the TFP even registering negative values in 1945-54 and 1981-90 (though the latter could

also be linked to under-utilised capacity) (Wright, Leibbrandt & Bell, 1993, pp 10, 58). Capital equipment, in its turn, was found to be inefficiently used concomitantly with "over-capitalisation" (Standish and Galloway, 1991, pp 21, 26) which again may tie in with a lack of discipline South African workers have been accused of (Goshi, 1996, p. 13), and managerial inadequacies.

Both Sk and PE would, of course, have positive values, but in comparison with those of better performing economies, they figure as fractions and, thus, as a discounting of L.

15.4 POVERTY

The two human factors of production, ENT and L, need the co-operation of, at least, one of the other three factors to produce the necessities of life. At the initial stage of development or under-development of a community natural resources usually serve this purpose. Their supply, given that there are no more minerals and metals to be discovered, is strictly limited in amount. Accordingly, as population numbers continue to expand diseconomies of scale begin to operate, reducing the income (or GDP) per capita (Yp.c., or Y/N), when all the bounties of nature have been exploited. Consumption of non-renewable resources means, in the nature of things, an irretrievable loss of future availability. This can even be true of renewable resources. In South Africa mining production, per head of the population, in value added terms at 1990 prices, stood at R541 in 1996 after peaking at R1254 in 1970. Gold production declined from 42,9 grams to 11,7 grams per capita. Value added by agriculture has barely kept pace with population growth, the per capita amount (at 1990 prices) having stood at R317 in 1946-48, R345 in 1969-71 and R325 in 1994-96 (SA Reserve Bank, March 1997 and previous issues; CSS, 1995, *South African Statistics*).

To compensate for the constraints imposed by natural resources, technology has to be developed and capital formed to accommodate increasing population numbers economically, or, at a minimum, prevent impoverishment. Intermediate agro-input technology tends to create a secondary need of technology to undo, or counteract, the harm inflicted upon the environment and productivity by technology applied in the past. Insofar as rapid population growth is associated with, and indeed a cause of poverty, it constitutes a more intractable and malignant influence than affluence which can or could provide the means for combating the ecological damage for which it has been responsible. Demographically induced poverty, which resolves

into poverty-induced poverty, cannot afford such provision; and a reduction of the population cannot be employed as a remedial measure.

It is also unlikely to afford the capital formation required to keep the labour force provided with a constant amount per member (widening) given the incremental capital-output ratio (dK/dY); or, if it does manage that, it is unlikely to raise productivity per labour force member through capital deepening. The relevant situation in South Africa has been quantified in Chapter 13.

During 1960-1976 savings (net of depreciation allowances) were adequate to provide for the widening requirements (8,1% of GDP) and leave 4,4 per cent for increasing the amount of capital per member of the labour force. During 1976 to 1984 labour force growth requirements could not be satisfied in full, while during 1984 to 1994 only one-third of such requirements could be met. It is necessary to observe that, statistically, the absolute size of the ICOR after 1976, at 4,3 – 4,5, was larger than the 2,8 per cent per annum LF growth rate and was thus responsible for the larger share in the widening statistic. However, a zero LF growth rate would release all savings for capital-deepening, whereas the ICOR would not conceivably diminish to zero. To keep a LF growing at 2,8 per cent per annum equipped, from own resources, with a constant amount of capital per capita at any reasonable level of the ICOR, is likely to be beyond the ability of poorer communities suffering from anaemic economic growth.

The difficulty is aggravated by the fact that not all of the savings are available for industrial capital formation, some of them having to be applied in "demographic investments", to provide organised living facilities for communities, that is: the lay-out of townships, housing, streets, sanitation, water and electricity reticulation, public buildings, schools, hospitals, health clinics, etc. There is, of course, no rule that can advise us what percentage of total S would, in fact, be used for such investments, because in practice, among poor communities, it would represent a residual rather than a determinant (based on needs) of what would remain for the formation of industrial capital (non-demographic investments). When it becomes a co-determinant, assuming the status of a claim on resources on a par with others, its insidious consequence for economic growth in low-saving communities emerges. For example: let us assume that a minuscule investment of R30 000 is required (twice the free gift of R15 000 given to the poorest of the poor by the government for housing) to provide the living facilities in question per nuclear family in South Africa. Accommodating the yearly increment of 275 000 families (a growth rate of 2,7 per cent per annum, backlog and depreciation ignored) will then absorb 47 per cent of total (net) savings generated according to the 1996 figure for the latter. The economic burden will be

rendered additionally onerous by the fact that the saving required for this purpose is, almost in its entirety, not accomplished by the beneficiaries who, up to the time of need satisfaction, are for the most part consumers only. And very large numbers of them, due to unemployment, are destined never to become earners even in gross terms.

The problem is compounded by the effect of rapid and differential population growth on the supply of savings. The redistributive transfer of economic resources from the low to the high fertility component of the population by way of expenditure on health, education, housing subsidies and social welfare, arising from differentially proliferating numbers, led to dissaving by the South African government which reduced total savings by an average of R20 000 million per year over the seven years 1992-1998[1], to diminish the actual net total generated to an annual average of R12 390 million, instead of the R32 390 million it would have been, had the current account of the budget recorded a zero balance (SARB, March 1999, p. S-125). Capital formation and economic growth are stunted.

What with human quantities unaccompanied by comparable human qualities, natural resources limited or inexorably diminishing in quantity and quality as the non-renewable resources, in particular, are being exhausted, and insufficient additions to the supply of technology and capital to keep pace with population growth (in part because the latter inhibits the accumulation of the necessary non-human factors of production), impoverishment, if not poverty, is bound to occur. The large majority of the poor are Blacks due to the fact that they constitute the large majority of the population, their high fertility, the vicious circle of poverty begetting poverty, traditional cultural traits, benign neglect and discrimination. The most conspicuous manifestations of this poverty are the squatter camps around towns and cities, land invasions and illegal occupation of urban property, street children and child labour. (Not all squatters are necessarily poor; they simply avoid rent and service charges; and for some street children their status is a voluntary option). (See Urban Foundation 1994) The 1995 October Household Survey (Central Statistical Service, 1996, p.52, 68) reveals that of the residential structures occupied by Blacks in urban areas 15,4 per cent consisted of shacks, and 42 per cent of all dwellings had inside flush toilets (compared to 70,2 per cent for Coloureds, 96,6 per cent for Asians and 98,5 per cent for Whites).

[1] Before the June 1999 national accounts' revision.

Poverty or affluence or welfare is not measured by income of GDP per capita (Y_{pc}) only. But it remains, and can be considered, a most important indicator, since it represents the source to be tapped for the provision of many forms of welfare. The level of the per capita income in South Africa has a history of a monotonically upward movement since the end of the second world war up to 1974, which year can be considered to mark the end of the golden era of the Kondratieff (or long wave); starting with R4514 (at 1990 prices) in 1948 and ending on R7945. Thereafter it moved falteringly to describe a cycle with a trough in 1977 but ending on an all-time high of R8354 in 1981. During the following twelve years the trend was downwards with few interruptions, to register a nadir of R6823 per capita in 1993; a decline of 18 per cent or 1,7 per cent per annum. By 1998 it had risen to R7025; an amount which was still below that of 1967.

Since Y_{pc} is a quotient it goes without saying that both the numerator Y, and the denominator N, (representing population numbers) have an influence on the outcome. (We are abstracting from the possibility that dN may become a function of Y_{pc}: the subject matter of the economic theory of fertility). While this is true in the statistical sense it does not tell us anything about the causal connection. There are writers who would exonerate N from all responsibility for an adverse performance of Y_{pc} and cast Y in the role of the villain, as if the generation of Y is an abiogenetic process without the need of the intervention of the elements of N. Levine and Renelt, searching for empirical linkages between economic growth and a variety of variables, in a sensititivy analysis of cross-country regressions, found a negative correlation between population growth and GDP (1992, p. 950). Which prompted the IMF to conclude that "the economic and social development and the alleviation of poverty hinge critically on greater success in slowing the rate of population growth" (1997, p. 89).

A study of the historic course of Y_{pc} in South Africa during 1946 to 1974 or 1946 to 1981 reveals that N can act as a reinforcing agent of growth via two routes: (i) the maintenance of demand as achieved economic growth puts increasing amounts of purchasing power into increasing numbers of hands; (ii) the support of the marginal product of capital as demographically-determined expanding supplies of labour constrain wage levels when there is no, or little, interference by trade unions.

In the first route N represents a secondary force attendant upon a growth of Y that was induced and fostered by non-demographic factors. During 1946-1974 (1981) these comprised the following: the voracious demand emanating from a resource-poor Europe after the devastation caused by the 1939-45 war and inducing a very rapid growth of world trade, creating many

opportunities for South African exporters who had to face relatively little competition at home and overseas; rising international terms of trade, predominantly favourable foreign balances of payments; a buoyant import-substitution production process, with import control affording maximum protection to domestic producers, and a predominantly peaceful labour force. The thriving economy resulting from this business-benevolent ambience attracted immigrants who supplemented the supply of entrepreneurship and highly skilled white collar professionals and technicians to boost the economic quality of the labour force, thus supporting an enhancement of economic performance.

By the end of the 1970s all these propitious circumstances had evanesced, to be replaced by vigorously hostile forces such as the violence in the ANC's struggle for political power and the abolition of apartheid, trade and, later on, financial sanctions, while foreign disinvestment proceeded apace; and anti-South Africa movements overseas propagated and organised boycotts. The considerable net immigration flow was reduced to a trickle and, at times, reversed into a net emigration movement.

Route (ii) was effectively closed when COSATU in response to an ANC directive that the trade union federation "should continue with any ridiculous wage demands they cared to make" (and most were ludicrous) "because it might help to bring the hated government to its knees" (Van den Berg, 1990) engaged upon belligerent rolling mass action in an attempt, in tandem with a campaign of non-payment for residential services – continued after its *raison d'être* had ceased to exist – to render the country ungovernable.

And so N became an unmitigated drag upon levels of living; both as denominator and as a numerator-reducing agent.

Population (embodying the result of fertility, mortality, morbidity, migration in the quantitative sense and economic culture in the qualitative sense) has been, at best, an economic growth-supporting force, whose hospitable attribute materialised when there *was* economic growth, sufficient to equal or exceed its own rate of increase. With rapid population growth dN is always in operation as an economic welfare-reducing agent regardless of what happens to dY. The former advances without any economic effort while dY requires much human endeavour associated with economic quality and not quantities, in co-operation with other factors of production. The source of this endeavour is likely to shrink in relative terms as the South African population component with the least ENT content continues to increase fastest. In this fertility

(and growth rate) differential (between Blacks and non-Blacks) we have a positive association of high fertility and high levels of poverty. Regardless of whether or not the former is a cause of the latter, the coincidence leads to a charitable redistribution of economic resources, which is inimical to growth: the economic accommodation of quantities of life reduces the resources remaining for the enhancement of quality of life. The intensity of this redistribution is closely correlated with the political power attained through high fertility operating on an ever expanding poverty-stricken component of the total population, which is continuously eroding the potential for further redistribution.

15.5 UNEMPLOYMENT*

The combination of a proliferating labour force (LF), a less than robust economy and militant trade unions (TUs) in alliance with the government, is a recipe for a stagnating job market, even in the absence of increasingly sophisticated labour-saving technology.

Seen from the employment perspective, the most significant aspect of TU activity is the severance of the nexus between the predominantly demographically determined supply of, particularly lesser skilled labour, and the market supply that is allowed to influence wage levels; accompanied by the employment-inhospitable environment engendered by their actions to promote the interests of their members. Whatever interest they profess in the fortunes of the LF at large, their labour market activities are centred on the welfare of their members only. Their prime concern, apart from maximising the remuneration of their members, is not the maximisation of employment, but the prevention of retrenchments which reduce their membership. And they request the unemployed not to enter into competition with them for jobs.

Overtly, the labour militancy evidences for the most part, a dissatisfaction with their remuneration. A "living wage" – which has the ring of the high moral ground to it, but has no connection with the marginal product of labour, and is not statistically delineated – used to be the target of agitation. By 1996 the wage gap, as between the upper and lower echelons in the skill hierarchy, appeared to have become the bone of contention. An office-bearer of COSATU maintained that "the most immediate obstacle causing so much tension in the workplace today is

* It is to be noted that labour market magnitudes are beset with uncertainties since the surveys and censuses of the CSS under new management (and now known as Statistics South Africa (SSA)) have introduced discontinuities in the historic series relating to size of LF, employed and unemployed. There is, in consequence, disagreement among the different sources of statistics and estimates (De Lange, SARB, CSS, SSA, Sadie). The post-1994 data proffered below represent an extension of the pre-1995 series.

the huge wage gap ... management use their counterparts in the First World Germany and United States as a yardstick for payment. But affordability for workers' pay is determined by what Third World workers in Indonesia and Malaysia earn ... management must stop seeing labour as a cost or a factor of production" (Coleman, 1996). The Minister of Trade and Industry (who became Minister of Finance in 1996) averred that trade unions were using management's salaries as a benchmark when negotiating new wage levels (Manuel, 1995). The Secretary-General of COSATU insisted that the South African labour market be treated as a First World institution in wage negotiations. This implies that the Third World lesser skilled labour surpluses were to be ignored.

The gap may be inordinately wide as a legacy of historic circumstances, but it has been market related. The demographically determined differential supplies of the various skill categories were not interfered with by Black TU action before these unions were accorded legal status. Relative scarcity was, accordingly, permitted full scope to function in establishing Black wage levels, while the very small managerial category has been, and is, in a position to fix its own remuneration. Actually, during the decades before 1980 it was repeatedly argued that management was using Black labour wastefully. If true, it was useful waste which, in light of the rapid economic growth, was affordable and provided a rapidly growing lesser skilled LF with increasing employment opportunities.

It is not inconceivable - particularly in light of their participation in the pre-1994 violent political struggle - that Black TUs stance may have more to it than the usual capital/labour confrontation. The "capital", that is the private sector economic power, is mostly in the hands of a different ethnic group - the White minority - so that any harm inflicted upon the economy could conceivably be considered as a decimation of the power of an "enemy", as these employers are sometimes referred to; a deep-seated adversative stance which renders the problem rather more intractable than in an ethnically homogeneous community. The over-representation of the SACP in COSATU and government leadership cannot be ignored either. Eventually an accumulation of unemployment that has left the majority of the LF without a job in the formal sector may be advanced as an argument for a revolutionary socialist (communist) régime. In the circumstances a *contrat social* does not have the flavour of a probable ingredient of an amicable *modus vivendi*. These circumstances and concomitant imponderabelia contribute to an environment of uncertainty in which employers, contemplating long-term programmes, have to operate. It is not conducive to flourishing capital formation for growth, development and employment creation.

Trade Union intervention in the labour market – and legislation allows them to strike legally also for socio-economic reasons which are not employer/employee related – establish wage levels which pre-empt, at any given level of economic growth and GDP, a maximisation of employment. ILO research personnel have contended that wage increases did not have a major effect on numbers employed in South Africa, as in other countries (Dasnois and Randall, 1996, p. 19). This assessment may be in consonance with Fallon's (of the World Bank, 1992) finding that the elasticity of Black employment with respect to wage levels was no more than –0,28; but not with his statement that the poor Black employment record can "overwhelmingly be traced to upward movements in Black wages" (1992, p. 27) and that wages, and not the low user cost of capital, were the critical factor (p 28). He added that White wages adjusted to maintain approximately full employment among their ranks. Another author concluded that, among the variables specified in his "equilibrium" co-integration functional equations, Black wages emerged as a "major negative influence on economic development" (read GDP Growth: Piazolo, 1995, pp316/7). He considered that as one of the misdemeanours of apartheid which, with influx control, would have created an artificial scarcity of Black workers. If his attribution is a valid interpretation, then it would seem that post-apartheid trade unionism has imparted an extra dimension to artificial scarcity. In 1998, after further research into South African labour markets, Fallon and Lucas estimated the average (across sectors) long-run wage elasticity for Black formal sector employees at -0,71. While not identifying wages as the major factor inhibiting employment growth - there are also rising capital intensity, declining private investment and skills insufficiencies to be taken into account - the earlier finding on the significance of their effect was re-affirmed. "Rising real product wages have had a substantial dampening effect on the demand for Black workers … If Black real product wages had remained constant in 1970 to 1994, Black formal employment would have grown at 1,48 per cent per year instead of the 0,9 per cent actually achieved" (pp 10/11). Similar conclusions have been reached in other studies (Barker, 1999, p. 12) even while the ILO has been disparaging organised Business' contentions about the job-destructive inflexibility of South Africa's labour market (1999).

Whatever the precise elasticity statistic may be, it cannot capture the entire effect of labour market conditions which comprise not only wage levels, but also the nuisance value of TU activity, economic turbulence occasioned by their manifestations of belligerence, and obligations imposed by new legislation to which employers have not been accustomed.

Of the TU confederations, COSATU, claiming membership of around 2 million (or some 13 per cent of the LF), mostly lesser skilled workers, is the most important since it is an influential

partner in the governing ANC/COSATU/SACP alliance. The ANC, while not always *ad idem* with its ally, does not want to lose the latter's support as the well-organised election-winning arm of the government. In consequence, COSATU has been instrumental in having various labour-beneficent Acts passed by parliament. To the AA ensconcing Employment Equity Bill discussed above - which is applicable to all ranks of employees - can be added the Labour Relations Act, the Basic Conditions of Employment Act and the Skills Development Act. Their salient features - apart from re-affirming the traditional workers' rights such as collective bargaining and the right to strike - can be summarily stated.

Collective bargaining is to take place at the sectoral, rather than the plant, level, and agreements reached can be extended to all firms in a sector whether or not they were party to the negotiations. Which means that allowance will not be made for differences in marginal product of labour among individual companies, while the establishment of small and medium-sized enterprises can be pre-empted or their continued existence jeopardised as a result of not being permitted to match wages to lower productivity levels. The working week - for the purposes of overtime, the remuneration for which is raised from time-and-a-third to time-and-a-half - is reduced from 46 to 45 hours. Minimum wages for agricultural and domestic workers are envisaged. Dismissals and retrenchments are to be negotiated with the workers, and lengthy periods of notice will have to be observed, while there is no bar to claims of unfair practice by the workers involved, since the onus is on the employer to prove that it is not. Some dismissals are automatically unfair, and those affected can claim up to 12 months' compensation from date of dismissal. The period of maternity leave is stretched from 3 to 4 months, and liberal sick leave provisions will obtain (which tend to be used for extended weekends). The minimum period of paid annual leave is fixed at 3 weeks (previously 2 weeks) so that together with 12 public holidays (but disregarding sick leave) workers are paid for not working 10 per cent of a 52 weeks working year. Employers have to contribute an amount equal to 1 per cent out of their payroll as a new training levy.

To these rules and regulations must be added all the AA provisions of the Employment Equity Bill, section 27 of which requires that "disproportional remuneration differentials" are to be reduced in accordance with advice from an Employment Conditions Commission. Whether this will eventuate by lowering the remuneration of high level manpower or raising the wages of lesser skilled workers the result would be the same: a movement further away from the sway of the unfettered supply of human factors of production in the market.

This labour legislation exhibits the symptoms of having been inspired by that of advanced economies where the Y_{pc} is a multiple of South Africa's; the proportion of unskilled labour and the levels of unemployment are a small fraction of that of South Africa, and the ability to ameliorate the effects of unemployment through the national budget is much greater. The Department of Labour has, in fact, acknowledged the co-operation of the Black Lobby, the Civil Rights desk and the attorney-general of the USA in the framing of the laws (Giliomee, 1998, p. 11), while the Chairman of the Friedrich Naumann Stiftung, and former German Economics minister, asserted that if South Africa were serious about job creation it should repeal the labour laws which, he judged, were cast in the mould of the German model (Malan, 1999, p. 5.1). These laws have been depicted by a labour law specialist as "the most TU-friendly imaginable ... for all practical purposes we have a labour government" (Backer, 1996: 17). The Institute of Management Resources in California found "the labour laws hopelessly biased to the workforce which has the lowest productivity profile in the world" (Todd, 1996). The chairman of Anglo-American Corporation was reported as stating that the Labour Relations Act conferred upon TUs a level of protection unequalled anywhere in the world (Britz, 1995: 2). Another maintained that the South African labour movement was "the most powerful in Africa, if not in the world" (Lunsche, 1994).

The legal requirements listed above are all destined to raise the costs, and lower the level, of employment. Transnet managing director complained that implementation of the new labour laws would add R800 million to R1000 million annually to the operating costs of the parastatal which was already suffering a loss of some R2 million a day. Even the ILO admitted that a 10 per cent rise in the costs of some sectors could occur (De Lange, 1999, p. S.5; ILO, 1999; Mittner, 1999, March 12). The AA provisions of the Employment Equity Bill compound the adverse effects. Members of the LF appointed under the auspices of AA could decide that they need not concern themselves about the quantity and quality of their inputs, secure in the knowledge that they have to be retained to satisfy the demographic targets, while the employers may find the costs of dismissal exorbitant (cf. Black & Rankin, p. 459). Productivity suffers. For the USA, well-known for its AA (in favour of a minority) a 1991 estimate has put the opportunity costs of AA - "bad hiring decisions under government coercion, negative effects on morale and a misallocation of financial resources" - at 236 billion dollars (Jafta, 1998, p. 5). "Race-based affirmative action policies encourage a culture of entitlement that undermines initiative, self-confidence and self-reliance" (p 5). A pernicious effect, particularly when practised in favour of a majority group as in South Africa, is the devaluation of human capital. In the case of employees - workers who do not operate on own account - AA reduces or denies

returns, in the form of a wage premium or job preferment, to human capital formation, thus removing the incentive to invest in this way. The effects are amplified when the process is not practised at the margin - i.e. in respect of new appointments - but involves a substitution of competent persons in office by lesser experienced, under-qualified individuals. The rule of meritocracy is disowned; the quality of the LF is debased.

In the perceptions of South African businessmen the sum total of the labour market conditions featured above cast an aura of inhospitality towards enterprise. The supply of entrepreneurship, already inadequate for the accommodation of the LF in the aggregate, is trammelled. Employers' reaction can encompass one or more of the following:

(i) They shift increased labour costs on to consumers, which process is facilitated if an inflationary spiral, induced by preceding wage hikes, is already in operation. Research at the SA Reserve Bank elicited the conclusion that "changes in labour costs are at the core of the inflation process ..." (Pretorius & Smal, 1994). This leads to potentially investment-curbing monetary policy inasmuch as the Reserve Bank is committed to the protection of the Rand.

(ii) They substitute capital and technology for labour to raise the marginal product of labour and to diminish dependency on labour, rather than engaging in the training of workers which is a longer term exercise, and may raise wages *pari passu* with higher skill levels consequent upon such training. A survey of 587 enterprises revealed that among manufacturers whose production process was not inherently capital-intensive the labour factor was the major determinant of increased capital intensity (Welcher, 1990: 74). Relatively scarce capital was being employed as if it were abundant in supply, and abundant labour was being used as if it were a scarce factor of production.

(iii) They retrench part of their workforce.

(iv) They change, as far as possible, the professional status of their workers from employee to that of independent contractor (or entrepreneur).

An adverse effect on employment is a foregone conclusion. Countervailing employment-creating widening of capital is inhibited. Capital available for such widening – and referring to employed labour, which was, and is, only a portion of the total LF – diminished from 5,4 per cent of GDP during 1960-76 to 3,1 per cent during 1976-84 to -0,8 per cent in 1984-94 and to -5,0 per cent during 1994-98 (inferred from SARB, various issues).

The negative percentages imply rates of capital formation lower than were needed to preserve the levels of employment, given the intensity of the deepening process. They spell reductions in the number of the employed.

In the domain of international trade the disregard of lesser skilled labour abundance in remuneration arrangements vitiates the possible comparative advantage that could have emanated from this abundance. Thus the soft undercarriage of the South African economy, the Balance of Payments, is rendered increasingly vulnerable; a vulnerability that is being exacerbated by the liberalisation of international trade, which is, in effect, pressuring the marginal product of South African labour downward. An outward-looking international trade policy and an inward-looking labour movement are mutually exclusive forces. While remuneration (at constant prices) per employee in this country has increased by 6,7 per cent between 1990 and 1995 (SARB), that of Zimbabwe, for instance, has dropped by over 50 per cent (Zimbabwe Reserve Bank, 1996, p. 3). Lesotho fears the infection of their labour market by the South African example while their garment workers, operating at a productivity level equalling that of parent companies in Taiwan, earn 44 per cent of their South African counterparts' wage, and "without a strike, a bus boycott or other disruptions" (Lunsche, 1994, p. 2). Which, among other reasons, is why the secretary-general of COSATU warned the government that "its blind loyalty to trade liberalisation will collapse the economy" (SAPA, 1995), and why the economy often has to rely on depreciating rates of exchange to promote the survival of some enterprises. And still the Minister of Labour wanted wages in the prominently foreign exchange-earning gold mining industry – a wasting resource and subject to periodically disastrous drops in price, and which cannot shift its increased cost on to buyers of its product – to be raised above those prevailing in the protected, net foreign exchange-consuming, manufacturing industry (Mboweni, 1997).

It is conceivable that entrepreneurs would be able to surmount the obstacles presented by the labour market conditions portrayed above, and still accommodate upward of, say, 90 per cent of the labour supply and accessions to the LF. But such favourable outcome is conditioned by the requirement of a LF composition which is representative of a highly developed country, a status South Africa has not consummated. For an intimation of South Africa's LF deficiencies in this regard, the 1985 LF by skill (White and Blue collar workers separately) has been projected to the year 2005, and the results compared to the numbers that might be demanded, assuming that the 1965-1985 experience in the labour market, would be replicated. Immigration was excluded. The results are assembled in Table 15.1.

TABLE 15.1

Skill category	**Difference between probable numbers supplied and demanded by the year 2005 in the formal sector**	
I	Deficit of	83 000
II	Deficit of	835 000
III	Surplus of	1 465 000
IV	Surplus of	5 860 000
	Total	-921 000
		+7 325 000

Source: Sadie – 1991, pp150-151.

The figures are indicative of a seriously flawed skills composition: a relative scarcity of high-level manpower (categories I and II, the managerial professional, technical and other highly skilled classes) and an abundance of semi-skilled and unskilled workers. It is this abundance, the issue of high fertility, that is not permitted to exercise a commensurate effect on wage levels in the formal sector.

If we accept that the availability of white-collar categories I and II is a prerequisite for the employment of the other classes of workers, the above manpower balance sheet disequilibrium is not tenable as a real life situation. The economy can function with unused surpluses but not with strategic manpower that is non-existent. Equilibrium would require that the above deficits be reduced to zero. (It is assumed that immigration does not act as a gap-filler and that the Ach factor among entrepreneurs remains constant). But this will entail increases in the surpluses of categories III and IV. Statistically, the reduction in question will occasion an increase in the surpluses at the lower end from 7 325 000 to 11 576 000, implying that less than half of the 20 156 000 strong LF will be accommodated in the formal sector by the year 2005. While that is not proffered as a probabilistic outcome – it has the appearance of a disaster scenario – it is, in light of the post-1989 experience, not even a very pessimistic picture. After having shed workers in its employ at a rate of 101 000 per annum on average between 1989 (the year of the peak) and 1998, the economy's projected performance implies an average increase in formal sector employment of 82 000 per year after 1996. And in 1996, 82 000 each year over 9 years looked like a very ambitious employment target, while the GEAR (the Growth, Employment and Redistribution programme, RSA, 1996) scenario of 409 000 jobs to be created annually by the year 2000 had the appearance of pure fantasy.

But it will still leave almost 400 000 out of an annual increment in the LF of 482 000, outside the formal job market, which means that 83 per cent of the LF increment will have to seek refuge in the informal sector and/or depend on state aid. Another alternative is a life of crime, which is more profitable than seeking a job: of every 1000 crimes committed in South Africa, it has been estimated, 450 are reported, and of these only 17 per cent result in a conviction in a court of law (SA Institute of Race Relations, 1996: p. 3).

The matter can also be explored by examining labour's share in the GNP. By virtue of the stability of the employee remuneration component of the GDP (Y at factor costs) we may posit that Y is a constant (k) multiple of the wage bill (W x L = wage x number of workers employed). Between 1989 and 1996, for instance, the component rose from 60,9 per cent to 63,3 per cent in 1992 and declined thereafter to 60,7 per cent in 1996/97, to average 61,8 per cent over the period (SARB, various issues). Accordingly $Y = k(WL)$ and $y = w + \ell$ (the lower case letters standing for rates of growth). Table 15.2 tells us how the increase in Y was absorbed by wage and employment increments, respectively, during four successive time intervals, and compares these with the growth in the total labour force (dLF).

TABLE 15.2

THE SHARES OF WAGE LEVEL AND EMPLOYMENT INCREMENTS IN ECONOMIC GROWTH

Period	$y = w + \ell$	dLF
1946-60	4,4% = 2,1 + 2,3	2,1%
1960-75	5,0% = 2,3 + 2,7	2,5%
1975-89	2,2% = 1,1 + 1,1	2,7%
1989-1998	0,82% = 0,86-0,04	2,7%

The following percentages of the LF employed in the formal sector underscore the information in Table 15.2.

1946	72,2%
1960	74,0%
1970	76,6%
1980	71,3%
1985	64,6%
1990	58,5%
1998	43,0%

It is clear that the increase in the average wage was less than half of the growth in Y until the middle of the seventies – which can be considered to represent the end of the golden era of the

Kondratieff – allowing an absorption of increasing portions of the LF, to reduce unemployment and/or underemployment, as judged by the formal sector performance. Thereafter wage increases absorbed half of the growth in GDP during 1975-89, so that only 41 per cent of the LF growth was accommodated. In the 1989-98 period the increase in average remuneration was responsible for 120 per cent of the addition to the wage bill, leading to an absolute reduction in the marginal and aggregate level of employment, leaving more than one-half of the LF not at work in the formal sector at any point of time. Some supporting evidence is provided by the following estimates of the GDP elasticity of employment in the

	Formal sector	Formal & Informal sector
1970-80	0,76	0,77
1980-90	0,49	1,01
1990-96	-0,55	0,16

Source: Loots, 1998, pp 330/1

In formal sector context the last decade of the twentieth century was a period not only of jobless anaemic growth, but, more injurious still, one of job-destructive economic activity. Even during the three years of exceptionally "luxuriant" growth (1994 to 1996), averaging 3,1 per cent per annum, employment continued sliding by between 1,2 and 1,8 per cent per annum. According to the SSA (1998, p. 34) the semi-skilled and unskilled workers have been the sufferers, their employed ranks having been emaciated at a rate of 5,5 per cent per annum between 1994 and 1997. It is these two categories of labour which are, in particular, the concomitant of high fertility. This outcome is concordant with the magnitudes presented in Table 15.1 and the SSA's findings in its 1997 October Household Survey (1998, p. 25) relating to the relative incidence of unemployment (according to the strict definition, which means the exclusion of those who have not actively taken steps to find jobs) among the four population groups, as follows:

Whites	4,4%
Indians	10,2%
Coloureds	16,0%
Blacks	29,3%
Average	22,9%

The incidence differentials are positively correlated with skill and fertility differentials.

Synoptically, the outcome of the above labour market trends can be portrayed as follows for the year 1998:

Labour force		16 660 000
Employed in the		
Formal sector	7 170 000	
Informal sector	1 080 000	
Subsistence farmers and		
Migrants in waiting	810 000	9 060 000
Non-employed		7 600 000
		= 45,6% of LF

When the SSA's ratios are applied fewer than one half of the 7 600 000 non-employed would qualify as unemployed according to the strict definition (1998, p. 3). Such disparity, together with differences in the interpretation of the LF size (or economically active population), divests the unemployment statistics of much of its meaning. Emerging as economically rather more meaningful are the numbers of jobholders per 100 of those in the (i) 15 to 64 age group and (ii) aggregate population, and how these numbers have changed over time. The figures for two dates, twenty-eight years apart, are as follows:

		1970	1998
(i)	In the age group 15 to 64	57	35
(ii)	In the aggregate population	31	21

The employment base of the population has been steadily eroded. Any potential benefits that could have emanated from the ageing process among the HFC's ranks have been dissipated. Between the two dates the burden of economic care of each 100 jobholders has been aggravated from 325 to 477 persons (which produces a marginal burden ratio of 984 persons).

When we add the employment ratio (EMR) to our initial specification of the effective amount of labour on offer, we have L x Sk x PE x EMR as the amount of labour in productive activity. There are here three discounts to which L is subject, at least two of them closely related to the growth and size of L. Potential benefits that might arise from large and rapidly expanding L are rendered nugatory.

Fertility levels in excess of the replacement level that have been, and are, producing lower skilled labour in abundance, and are preponderantly the cause of the lack of human capital in question, have no economic merit. They add to the unmitigated burden of the community. Improvident parenthood, in concomitance with a labour movement unwilling and an employer corps unable, to accommodate it economically, is exacting an alarming toll. In the circumstances economic growth becomes all the more important, not because it is the source of new jobs, but because it is required to ameliorate, through redistribution, the poverty induced by the economically surplus population. In the meantime, affirmative action is in progress which - requiring as it does the reflection in the workplace of the population's ethnic composition - is tantamount to accrediting reproductive largesse with superior status as occupational merit. It is not calculated to promote a flourishing of the economy.

However, the pernicious effect of joblessness is not confined to poverty. The organisations UMSA (Unemployed Masses of South Africa) and the Malamulala Social Movement have a countervailing role to play by continuing to insist that their members have a right to decide for themselves whether they wanted to be "exploited" or not to gain entry into the ranks of the employed (SA Chamber of Business, 1998, p. 1). Their opportunity cost is zero.

15.6 THE ECONOMIC VALUE OF A LIFE

To estimate the economic value of a life at birth – in our example that of a male member of the Black population destined to enter the labour force as an unskilled worker – we have recourse to the following data and assumptions:

(i) The series of earnings by age used in Table 13.3 but with the R6800 per annum entered in that Table against age 15-19 now assumed to start when the child is born, rising by 1 per cent per annum up to the age of 60. The amounts are multiplied by the age-specific probabilities of employment which are assumed to average 0,27 over a lifetime. This statistic is derived from the manpower coefficient of replacement in a stationary job market (jobs becoming available being only those occasioned by death and retirement among the manpower group). Thus the probable earnings (E) per year are determined.

(ii) The consumption by age (C) data as assembled in Table 11.2 which are consistent with the earnings levels mentioned in (i) above.

(iii) Next, the differences between E and C values are determined, and these are multiplied by the probabilities of survival by age from a life Table (1991-96) for Black males.

(iv) The results of the step (iii) operation are multiplied by 5 to make provision for the fact that quinquennial age groups are being used in the exercise.

(v) The values obtained in step (iv) are discounted to the date of birth at a rate of 7,5 per cent which measures the average net returns to fixed capital stock in South Africa during 1982-1996. (This rate marks the end of a long period of diminishing returns, from a peak of 16,9 per cent in the immediate post-war years). Whatever the arguments against the discounting procedure, it is an economic imperative, representing as it does the alternative productive use of economic resources which would have benefited the community in the absence of the new birth.

Table 15.3 shows a negative amount of R8 370 as the economic value of a life examined here. Every new birth reduces the economic well being of the community. To reveal the significance of the demographic forces involved, the exercise was repeated using the same earnings and consumption series, but applying the (i) probability of employment by age of White males, averaging at 0,70 over a lifetime, compared to 0,27 in the exercise for Blacks, and (ii) their probability of survival by age. Both forces at issue are of a purely demographic nature, involving fertility, mortality and age structure. While the second is a function of mortality only, the lower survival ratios of the Black population can also be regarded as representative of its more youthful age structure which results from higher mortality and fertility. When, as occurred during the 1990s, the vacancies resulting from mortality and retirement are not filled in toto, the probability of employment is reduced below its already low level of 0,27.

Compared to the negative R8 370 found in the case of Black males the White population shows a positive R6 600.

When the discounting procedure is omitted the outcome for the Black population is a positive R9 360, but the disadvantage of its high fertility is not thereby eliminated. The amount pertaining to the older, low fertility, White population is 24 times as much. Because of demographic factors only, the economic value of the average Black male is therefore one-twenty fourth of that of his White counterpart. Inclusion of the female populations in the exercise does not change the conclusion.

The outcome of the computations above reinforces the conclusions drawn in section 15.5. The high fertility of the HFC is impoverishing the families concerned and the population at large.

In the last instance, the significance of the economic value of a life is not divorced from the value system of a society. There is no reason why a society could not hold non-economic values in higher regard. Rationally, the condition attached to such choice is that any inimical economic consequences have to be accepted. In practice, this condition is seldom satisfied. The culture of arrogation prevails.

TABLE 15.3

THE ECONOMIC VALUE OF A LIFE (BLACK MALES)

Age	Earnings rate p.a.	Probability of employment	Probable earnings E	Consumption p.a. C	E – C	Probabilities of Survival	Columns (6) x (7)	(8) x 5	Column 9 discounted at 7,5% p.a.
0-4	R6800	-	-	R860	-R860	,93	-R800	-R4000	-R3220
5-9	R7100	-	-	R1200	-R1200	,92	-R1104	-R5520	-R3095
10-14	R7500	-	-	R1490	-R1490	,92	-R1371	-R6855	-R2677
15-19	R7850	,12	R942	R1880	-R938	,92	-R863	-R4315	-R1174
20-24	R8300	,25	R2075	R2100	-R25	,91	-R23	-R115	-R22
25-29	R8700	,32	R2784	R2100	R684	,89	R609	R3045	R402
30-34	R9100	,34	R3094	R2100	R994	,87	R865	R4325	R400
35-39	R9600	,36	R3456	R2100	R1356	,85	R1153	R5765	R370
40-44	R10100	,35	R3535	R2100	R1435	,82	R1177	R5885	R260
45-49	R10600	,35	R3710	R2100	R1610	,78	R1256	R6280	R195
50-54	R11200	,34	R3808	R2100	R1708	,73	R1247	R6235	R135
55-59	R11700	,32	R3744	R2100	R1644	,67	R1101	R5505	R83
60-64	R11700	,25	R2925	R2100	R825	,59	R487	R2435	R26
65-69	R5800	,14	R812	R1770	-R958	,50	-R479	-R2395	-R18
70-74	-			R1660	-R1660	,38	-R631	-R3155	-R23
75-79	-			R1660	-R1660	,26	-R432	-R2160	-R8
80-84	-			R1750	-R1750	,15	-R263	-R1315	-R3
85+	-			R1900	-R1900	,13	-R57	-R285	-R1
Aggregate		,27						R9360	-R8370

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